The Journal of the American Medical Association

VOL. XX. CHICAGO, MAY 20, 1893. No. 20.

ORIGINAL ARTICLES.

A SUMMARY OF ELECTRO-THERAPEUTIC WORK IN A PRIVATE HOSPITAL.

Read before the Philadelphia County Medical Society, April 26, 1893.

BY G. BETTON MASSEY, M.D.,
OF PHILADELPHIA.

The recent growth of private hospitals devoted to abdominal surgery and other operative procedures deserves attention as indicative of an increased appreciation on the part of the profession of the responsibilities of its work. These institutions have risen in response to a real need. The conscientious surgeon is no longer content to subject his patient and reputation to results necessarily attending operations in offices, private houses, hotels and public hospitals, the latter primarily intended for the alleviation of the poor. A refinement of technique that would ensure the best results required the creation of a machine adapted to the highest quality of work. It is not a little surprising that this most ordinary provision of a proper means for effective work in relieving and curing human suffering should have been so long neglected by the medical profession, while the meanest trades that minister to the wants and vanities of the race have been housed in light and airy apartments, specially arranged for their proper and convenient prosecution.

The private hospitals for major operations have come, and have justified themselves. An extension of this sensible idea now presses upon the profession. If major surgery and the surgery of last resort needs this environment for its success, why should we neglect to supply analogous armaments to the work of curing diseases by conservative means?

There is in fact a double reason for such establishments, for the reënforcement and enlargement of our power to actually cure diseased organs not only leads to greater success in such high work, but lessens also our need to resort to the cruder methods of amputation and removal of parts of the human body yet capable of restoration to health.

An establishment thus devoted to the highest development of the possibilities of electricity and allied agencies in medicine and surgery has therefore a reason for being, in the mere fact that to be well equipped is an important part of the battle in any special line of medical study and art. It has also a reason for existence, more peculiar to itself, in the fact that the principal remedy in its equipment is itself in a transition state, and yet but imperfectly understood. To understand and apply in the most successful manner what is already known of the remedy requires technical knowledge of no mean extent, costly apparatus, and particular facilities; and when the extension of our knowledge of the agent is also considered, the value of enlarged facilities is even more evident. It is true that many of the uses of electricity in medicine may be prescribed and applied by a physician without an extensive knowledge of the agent, just as he prescribes a ready-made pill, but the highest possibilities of the advancement of therapeutic knowledge in this way are as impossible as that a mere user of the telephone could have done Edison's work.

Such were the considerations that determined the establishment of a private hospital for the development of electro-therapeutics in this city, and the cordial coöperation in the work by many members of the profession has already enabled me to present a brief summary of the results accomplished.

A variety of cases have been under treatment, in the majority of which electricity has formed the principal therapeutic agent, though a not inconsiderable number have received electrical applications as a secondary part of the treatment; rest, massage, regulated exercise and internal medication being associated with them.

FIBROID TUMORS OF THE UTERUS.

Twenty cases of myo-fibromata of the uterus were admitted, presenting many variations of the affection. Of the twenty cases fifteen were of the ordinary solid varieties, to which the Apostoli method is now generally regarded as applicable.

The results obtained in these fifteen cases of solid, interstitial and subperitoneal growths were as follows: No further growth occurred in any, and a complete symptomatic cure was obtained in each of these fifteen tumors thus symptomatically cured; two were also anatomically cured, the growth disappearing entirely in each; ten were greatly reduced in size, two slightly reduced in size, both being still under treatment; and one was not affected as to size.

The five remaining cases were all intra-uterine growths, two being solid polypi with small pedicles. The latter were brought into the vagina by the use of faradic currents and ergot and removed by torsion and division, after which the cavity of the uterus was treated by intra-uterine galvanic currents to prevent a possible re-growth. Three cases were cystic intra-uterine growths of the most formidable kind described. It is well known at present that cystic growths, as a rule, are not amenable to electricity, and after attempting relief by external methods in one of these, a lack of success caused me to refer it to a surgeon. The second intra-uterine cystic growth, forming a tumor as large as an adult head, having been referred to me by a prominent surgeon, was treated by the intra-uterine method with unfortunate results, owing to a failure to maintain asepsis. Death occurred from septicæmia two weeks after admission into the private hospital, as elsewhere reported, the sepsis having been received during office practice.

The third intra-uterine cystic tumor, and the final one of this list, was almost an exact counterpart of this fatal case, though the spongy intra-uterine mass was vascular. This lady was sent to me by a surgeon who recognized the difficulties attending hysterectomy with a wildly dilated cervix, even if she had consented to the operation. After mature deliberation and attempts to enucleate piecemeal, which were desisted from owing to frightful hemorrhage, I decided to apply strong necrosing currents [from 400 to 600 ma.] directly to the presenting portions of the mass at the external and internal os, being convinced of my ability to maintain a reasonably asep tic condition by continuous irrigation, a suggestion which I owe to Dr. Slocum. These currents applied after the bipolar methods practically dissolve tissues in the immediate path of the current, and produce a coagulated condition of living tissue at the periphery of the destroyed path that in itself is a bar to septic absorption for a time. Under this treatment the whole tumor was gradually removed without a drop of blood, as a rule, and at the present time the uterus is almost normal in size.

Reserving an opinion on the future of electricity, in cystic growths of the uterus, it will be seen that these statistics do even more than corroborate Apostoli's claims, for the tumors in at least two of the cured cases disappeared completely by absorption.

CHRONIC METRITIS.

In spite of the prevalent impression that chronic catarrhal metritis is a rare disease and relatively unimportant as compared with inflammatory conditions of the appendages, eight cases admitted into the institution were diagnosed as suffering primarily from this affection. In seven of these the diagnosis was corroborated by the therapeutic evidence of relief of symptoms and restoration of health after cure of the local disease of the uterus. Each of these cases of cured metritis and one case not relieved, with a single exception, showed a general impairment of the health, amounting in some cases to pronounced nervous prostration, and in the treatment employed the disturbance of the nervous system received ample recognition. Mere office treatment with electricity would doubtless have been unavailing in such cases. The nervous symptoms demanded their share of attention; yet had not a gynecological electrical treatment been associated with the rest, massage and general electricity, a failure to relieve would have been equally certain. This class of cases is a continual reminder of the need of the practical association of a gynecological and neurological training in the worker in the diseases of women. The physical and the nervous woman are conjoined by nature in both health and disease, and no mere nosological classification will separate what nature has thus joined together.

Two of these cases were samples of that unfortunately increasing number of women whose relatively normal ovaries have been removed for what was really uterine disease, and I regret to say that the only instance of failure to attain a practical cure was in one of these. A persistent uterine leucorrhœa had continued in this case two years after removal of both ovaries. The discharge was purulent, and emitted an odor so unusually offensive, though unlike that from carcinoma, that I suspected its origin to be an infected ligature at the uterine end of one of the cut tubes.

NEURASTHENIA, HYSTERIA AND NERVOUS PROSTRATION.

Seventeen cases of the allied affections of neurasthenia, hysteria and nervous prostration were admitted to the institution, and in their treatment electricity was made to take a more important role than is usually given it. Recognizing the self-evident fact that nutritive disorders play an important part in the pathology of these affections, and that in some of them the real affection is an auto-intoxication of the system from imperfect action of the organs of digestion, assimilation and excretion, these organs and their controlling nerve plexuses were subjected to the action of galvanic currents of an amperage hitherto unused in such methods. The results have proven the great value of this modification of the rest treatment, rendering cases amenable to it that were failures under the severe stress of mere enforced rest, seclusion and massage. Experience has dictated also that the faradic current usually employed in these cases as a general muscular and sensory stimulant is best replaced by the galvanic current applied with a large flexible pad as active electrode, well soaped to render its labile action agreeable. The surface reaction is far greater than possible in the usual faradic method, and to this is added a stimulation of deeper structures by direct chemical changes that is possible only with this current.

PERIMETRIC INFLAMMATION.

Two cases of perimetric inflammatory deposits associated with the adhesions of old pelvic peritonitis were admitted and treated mainly by the vaginoabdominal method. The most successful result was attained in the case in which the cataphoretic transmission of potassium iodide through the parts was used in connection with the current, old adhesions being loosened, and painful cellulitic deposits and enlarged tubes rendered painless and reduced in size. The addition of a resolvent agent so well known as iodine to the absorbent action of the galvanic current can not be other than extremely valuable in this class of work.

MALIGNANT GROWTHS.

Two cases of sarcoma of the fundus uteri were under treatment for a time, without results that amounted to more than moderate palliation. If electricity has a field of usefulness in carcinoma it is only when the seat of disease can be more readily reached, as in such cases as cancer of the cervix. An experience gained elsewhere convinces me that the palliative effects of electricity in cancerous conditions of the cervix are very valuable, and that they may even be curative when the disease is still distinctly local.

DESQUAMATIVE ENTERITIS.

Three cases admitted into the institution suffering from prostration and chronic invalidism, supposed to be due to disease of the uterus and ovaries, proved to be instances of desquamative enteritis. One of these had been treated for fifteen years for ovarian disease by one of the most prominent practitioners in the country without the true nature of the disease being suspected, and another had been mistakenly diagnosed and treated for five years. A study and examination of the stools, which is invariably made in obscure cases, revealed the true character of the trouble, a chronic desquamative inflam-

mation of some portion of the intestinal tract, usually the colon. In one of these a pulsating tumor lay in the left hypochondriac region, doubtless consisting of thickened membrane and enlarged glands lying over the abdominal aorta. In another case the pulsation was also manifest, and all the cases were bronzed to a varied degree. One was discharged much improved by a treatment consisting of the nitro-hydrochloric acid, arsenic, external galvanic currents and regulation of the diet, and two cases are improving under treatment of a similar character.

My experience in this affection has convinced me that many cases remain undiagnosed by physicians who neglect to avail themselves of the signal aid given in obscure chronic diseases by sytematic examination of the alvine discharges.

MISCELLANEOUS.

Other cases admitted presented instances of ovaritis, menorrhalgia chlorosis, pernicious anæmia, obstruction of the bowels, meningitis, chorea, multiple neuritis, musculo-spiral spasm, hæmiplegia, locomotor ataxia, etc., in some of which excellent results were obtained; but as the number of each was limited, no general deductions from them will be presented at the present time.

212 South Fifteenth St.

PUERPERAL SEPSIS—LAPAROTOMY.

Read by invitation before the Kansas City Academy of Medicine.

BY A. H. CORDIER, M.D.,
KANSAS CITY, MO.

For ages the cause of "Puerperal Fever" (which is a symptom—not a disease) was supposed to exist in the atmosphere of the lying-in hospital or chamber; it was believed that the fever was an *infectious, contagious disease*—that it was not necessary for actual contact to take place. The many opportunities both on the operating table and in the dead room for studying its pathology have cleared up the mystery. As a result of the recognition of its septic character within the last few years, the puerperal woman has been looked upon as a wounded woman and has been treated as such; so it is now a rare occurrence for a woman to have a "bad getting up" after confinement because practitioners recognize the principles of aseptic surgery and apply them intelligently to the treatment of the lying-in woman. With clean hands and surgically clean instruments used by a clean physician in doing the work in this physiological process of labor the woman will rarely have puerperal fever from *outside sources.*

The causes may be divided into autogenetic and heterogenetic—*i.e.*, self-infection (*from within*) and bacteria introduced from without. In the first type the pathogenic microörganisms are located at one or more points in the genital canal, the fallopian tubes and uterus being by far the most frequent localities, especially the tubes; here the bacteria find a hiding place until the resisting points of the surrounding structures are weakened by any cause; then they produce their direful results. They multiply the instant proper culture fluid is supplied. It is undisputed that the same microbes developed in one fluid may offer more resistance to germicides than those cultivated in other fluids. The recognition of this fact alone explains why germs remaining in the vagina, cervix or uterus as innocuous tenants may, during the puerperal period, take on vicious tendencies, multiply rapidly in the lochia and quickly produce the symptoms known as "puerperal fever," and the pathological conditions now recognized (in the majority of instances) as metro salpingitis with the ever present pelvic peritonitis—not cellulitis. The lochia should be a normal fluid following a physiological process, but this like all other healthy processes may be subject to a wide variation, and yet from a clinical standpoint remain within the limits of the lines of health.

A woman with a purulent or catarrhal salpingitis of one or both tubes at the time of her confinement is certainly in more or less danger of developing a puerperal peritonitis or a fever with the accompanying phenomena so vaguely called "puerperal fever" (a term the sooner relegated to the past the better for the lying-in woman; as long as this unmeaning term is used by book writers and teachers, so long will it be necessary for us to unlearn in practice some of the teachings of our illustrious preceptors).

In order to intelligently understand the various types of puerperal sepsis it is necessary to keep in mind the dominant local process producing the symptoms. In arriving at an opinion as to the character of the local pathological process much information may be gained by the educated finger in examining the case, to which of course, as in all diseases the clinical history must be added.

The woman may or may not give a history of previous attacks of salpingitis. Recurring attacks of salpingo-oöphoritis usually result in a closure of the abdominal tubal osteum, consequently pregnancy is not likely to occur if the disease is located in both tubes. Early in pregnancy the woman may contract a gonorrhœa of one or both fallopian tubes. The disease may remain latent up to confinement. During the contraction of the uterus in the expulsion of the child an adherent fallopian tube filled with pus, swarming with poisonous germs, is ruptured or a closed fimbriated extremity is opened up giving vent to this virulent fluid. The peritoneum is inflamed, either locally or diffused, according to the individual susceptibility or immunity to the amount of escaped septic material. If the fluid ladened with the septic microörganisms escapes in large quantities into the peritoneal cavity the resulting peritonitis is generally of a diffused character, accompanied by the usual symptoms of a diffused septic peritonitis running its course quickly, terminating in death within two or three days unless early surgery, with gallons of sterilized water and a drainage tube saves her. *The surgery must be done at once.* If the leakage is slight or if the inflammatory process extends by continuity, from tubal mucous membrane to the serous peritoneal coat, the symptoms are not so quickly developed, neither are the results so rapidly disastrous. This is the usual type of the disease, *i.e.*, the special form under consideration (autogenetic).

When this process is once inangurated in the puerperal woman, no one can foretell with a certainty its progress. Each case individualizes itself and it must for the time being rest with the judgment of the attending physician and surgeon as to the course to be pursued in the case under investigation.

If the attack bids fair to run a mild course as indicated by the mildness of the constitutional symptoms and the trivial local manifestations, the advisability of any operative procedure may be placed in

the balance and weighed while the case is being scrupulously watched for the development of unfavorable indications. The moment such are observed delay should be countenanced no longer.

Gonorrhœal pus is not by all odds the most dangerous fluid we have to deal with in the peritoneal cavity. The gonococci thrive best in localities lined by columnar epithelium, the endothelium of the peritoneum is an almost insurmountable barrier to the farther progress of gonorrhœal infection. It is rare indeed to find an unmixed infectious fluid in the tubes as the ever present pyogenic bacteria soon associate themselves with the gonococci in their destructive invasions.

If at an operation or a post-mortem on one of these cases (puerperal fever) an ovarian abscess is found or a fallopian tube filled with pus, with pathological changes well marked, one may be certain that these changes antedated the attack of peritonitis and may conclude safely that in this locality the starting point of the diffused inflammatory trouble has been found.

There are other localities in which under favorable circumstances, systemic infection of the gravest type may take place. In the uterus, a retained infected clot, or a portion of the secundines may give rise to putrid absorption (sapræmia); or a true septicæmia from absorption of pathogenic bacteria and the preformed ptomaines may arise. Either of these conditions is liable to extend to the fallopian tubes and (if the woman lives long enough) develop secondarily the special form of puerperal disease under discussion to-night. It is true that in the puerperal sepsis of vaginal, cervical or uterine origin there is often produced pathological changes in the pelvis, but these changes follow later in the disease than if the trouble was primarily in the tubes.

An œdematous swelling is often felt at one or both side of the uterus where lymphatic or venous absorption of septic material is taking place, but it must be remembered that this poison is outside the peritoneum and that the outer side of this serous sac has wonderful resisting powers to septic invasions.

Even in the rare instances where (following a cervical laceration) *a true pelvic abscess* forms in the broad ligament holding a pint or more of pus, the upper or intra peritoneal side of this membrane will be found perfectly healthy in many instances and all the pelvic viscera free from any marks of inflammatory disease.

Where the uterus is the focus of absorption the systemic symptoms develop early—of an intense character owing to the large absorptive surface exposed to the poison. The woman may die before any local results have had time to develop. The uterus will be found large and soft, and an early, thorough and oft repeated antiseptic irrigation may cause the alarming symptoms to disappear quickly. If the disease is in the main located in the tubes, irrigation will avail nothing, and the pulse and other indications upon which we rely for a favorable prognosis will remain unchanged.

The temperature is very misleading in all forms of puerperal sepsis; especially is this true of that variety in which the intensity of the disease is located in the peritoneum. The pulse, tympanitis, and physical examination of the pelvic organs are the most to be relied upon in giving a prognosis.

Before resorting to operative procedure investigations should be carried in all directions, that no mistake be made, and if in doubt as to the exact source of the sepsis, begin with the less hazardous procedure and watch the results closely, keeping on the alert constantly for any new developments that would point to any error in diagnosis that the method may be intelligently changed with a fair prospect of saving the patient. *Do not persist in one treatment too long unless marked improvement is seen and is continuous.*

If this early treatment has produced rapid improvement and the patient does not have recurrences of the bad symptoms, while continuing this course, one may feel sure that the right treatment is being pursued. For instance: a woman two days after labor has a chill followed by a temperature of 105° F., checking of lochia; antiseptic intra-uterine injections are used, three or four times in the twenty-four hours, the patient's temperature comes to normal, the lochia returns and the patient's condition is quickly changed from one of great danger to a comparatively safe state. Now this woman may remain free from fever and her convalescence be uninterrupted by any bad symptoms. If the symptoms were produced by absorption of putrid material, and if the treatment has removed the offending substance all is well, but, now if any of this poisonous decomposing mass is left behind and infection with the staphylococcus or streptococcus takes place, an inflammatory process is quickly lighted and extends rapidly to the fallopian tubes, and the woman either dies of sapræmia, septicæmia or by the slower and more painful peritonitis, abscesses, secondary to tubal extension; or she gets well from quick and sensible surgery or has a slow convalescence, followed by prolonged invalidism. How many cases have we all seen giving a history like this?—"Was confined for the last time two or fifteen years ago, had childbed fever, has not seen a well day since, up one day about the house, but down the next. The cot or bed is her greatest comforter." I saw two cases like this, to-day. Examination revealed old inflammatory bands binding down a large subinvoluted uterus, the cul-de-sac filled with adherent fallopian tubes, ovaries, signoid and coils of ileum. Surgery will cure both these cases at an early date.

Case 1.—This case was a patient of Dr. Ritter of this city, a careful clean practitioner, doing considerable obstetrical work. All aseptic precautions were thoroughly carried out during the delivery. The patient "died, not as a result of the surgery, but in spite of it." Had this patient been operated on earlier her chances for recovery would have been greater. An operation had been urged for several days before the consent of the patient was obtained.

This lady, nineteen years of age, confined in December; first child; perineum lacerated down to sphincter; had a clean delivery attended by a clean doctor. Two days following confinement had a chill followed by fever of an inflamatory or septic type. Uterus irrigated thoroughly and curetted at this time, followed by a slight decline of the febrile symptoms for a short time; the pulse remained up to 120 to 130, an indication within itself that the woman had trouble that had not been removed. The fever soon returned to its former height and would remain high until a diarrhœa (drainage) reduced it for a day or so only to return again. For five weeks her case had pursued about this course; at this period I saw her the first time. Her temperature at my first visit, was 102° F., pulse 130, and very weak. Examination revealed a *healed perineal tear*, and the uniform œdematous infiltration in the vaginal vault known to the older authors as pelvic cellulitis. An inflammatory diaphragm extended from one anterior superior spine to the other; no fluctuation but great tenderness. Uterus not large.

Operation performed in sixth week following confinement. Two days before operation her temperature was 103° F., pulse 130. A thorough purging in preparing her for the operation reduced her temperature the day before the operation to 99° F. On morning of the operation her temperature was 97° F., pulse 130, an unfavorable condition it is true, for an operation, but bid fair to be the best I was likely to find her in.

At the operation I found as I had predicted, many firm inflammatory bands binding down the uterus, matting together the intestines, omentum and tubes. *The uterus was firm and about the size one would expect to find five weeks after delivery.* The ovaries and tubes on the right side were filled with pus and firmly bound down under the uterus; the left tube was likewise distended with pus; there was nothing left of the left ovary but a cheesy disorganized mass. The adhesions were broken up, sound organs liberated and diseased structures removed, the peritoneum irrigated, and glass drainage tube introduced. Entire time of operation thirty minutes. The patient reacted nicely and bid fair for forty-eight hours to recover. At this time her heart gave out and my patient died—not from an extension or rekindling of the peritonitis, but from exhaustion induced by her long illness prior to the operation.

Every puerperal woman developing a fever does not necessarily imply that a laparotomy is the only resort, but it does signify that she has somewhere a cause for the fever and that the focus of absorption is in the genital tract in the majority of cases. The variety or location in this tract should point out the proper treatment.

This case was operated on since this article was read. I now add it to the above report.

Case 2.—Puerperal Sepsis. — Laparotomy.—Recovery. — This lady two or three days after labor developed a "puerperal fever," having suffered much in region of right ovary during the last few months of her pregnancy. When I saw her two weeks after confinement she was having a septic fever, with much pain in pelvis. Examination revealed a "boggy" mass to right of uterus extending to a level with the anterior superior spinous process. This examination was made two weeks after labor. She was septic, temperature running from subnormal to 104° F., pulse from 110 to 140.

Operation revealed the true character of the mass to right of uterus; omentum, bowel, fallopian tube and ovary all matted together. The tube was cheesy and disorganized, showing well marked evidence of long pathological changes. Sound organs liberated and diseased structures removed, gallons of hot sterilized water used with irrigator, drainage and recovery.

This was certainly a case of autogenetic puerperal infection. That the woman was septic, as much as any one could be and live, is beyond doubt.

The right fallopian tube and its contents were responsible for the attack.

DEDUCTIONS.

1. Many cases of puerperal sepsis develop regardless of any aseptic precautions on the part of the accoucheur. In the majority of cases in this type of the disease the foci of infection will be found in the fallopian tubes.

2. Fallopian tubes may be infected with the gonococci, or other specific or pathogenic bacteria after impregnation.

3. Pathogenic microörganisms develop more rapidly and are more virulent during the puerperal period. This is due to the fact that (either) the secretions are more favorable culture fluids or there exists a weakening of the resisting powers (want of immunity) on the part of the lying-in woman.

4. Rely upon the physical examination of the case under investigation in classifying the form of the disease you have to deal with.

5. After deciding as to the location of the poisonous foci, the treatment at once suggests itself.

6. If in doubt as to the source begin with the milder procedure and watch closely the results of your treatment. If permanent improvement does not soon take place direct your course in another direction. Surgery in these cases must be done *early, thoroughly* and quickly to insure the lowest rate of mortality. Delayed and imperfect work will, in these cases, always bring disastrous results.

Rialto Building.

CONTAGIOUSNESS OF CONSUMPTION.

Read before, and unanimously endorsed by, the Medical Association of Georgia, April 20, 1893.

BY J. G. HOPKINS, M.D.,
OF THOMASVILLE, GA.

The question as to whether consumption is contagious or not is one of vital importance to posterity as well as to the present generation. While the theory of Koch is becoming generally accepted, there are still many who are skeptical upon the subject. These skeptics, in a great measure, are confined to those who have not given the work of Koch and his collaborators much of their time or attention. They look upon the bacillus as septic or putrefactive rather than pathogenic. I have joined that growing army which places tuberculosis in the category of contagious diseases, and my experience with this disease during nineteen years of investigation in Thomasville, which place is a resort for consumptives, bears me out in my opinion and makes me a willing subject of the great and erudite Koch. I do not intend, in this article, to delve in the depths of science by entering into minutiæ, but simply to deal with facts as we find them.

We will take, to begin with, the negro, a creature in whom, prior to and during the war between the States, consumption was unheard of. In those days he was properly fed, properly clad, kept out of doors in the day time, was never crowded, and rest at night was compulsory. This process kept him, as far as possible, up to the "norm," and he was better enabled to wrestle with such disease germs as may have invaded his person. There is a vast contrast between then and now; his environments are materially changed, as any resident of, or sojourner in the South can testify. It is a well known fact, as shown by the records of our sexton, that more negroes die of consumption in Thomasville since the place has been a resort than ever before, and we find also that most of those who die of it have been at some time or other connected with some hotel or boarding-house in the capacity of chambermaid, laundress, or some other which exposed them more than others to the invasion of the tubercle bacillus. It is true that the whites escape to a far greater extent than the blacks, but it is also true that they are not as intimately connected with these subjects, and it is a well known fact that the whites possess far greater powers of resisting disease than the negro—except those of malaria and syphilis. We see this exemplified more particularly in diseases of the air passages. The percentage of recovery from pneumonia is so small that it is rare for a negro to recover from a severe case of the disease.

Frequently we find that the wife of a consumptive husband, or *vice versa*, comes down also with consumption, and dies as did the loved companion of life. Many instances of this character could be

mentioned in which it was impossible to trace any family taint whatever in the subject last to succumb to the disease, the one evidently contracting it from the other. We may and do inherit color of hair, eyes and many family characteristics, and we do also inherit conditions of lungs and throats which supply proper pabulum for sustenance and afford ample culture fields for the propagation of the tubercle bacillus, hence we frequently find that more than one member of the same family dies of consumption.

I do not doubt but that all men, women and children at some time or times receive into their air passages the tubercle bacilli, but fortunately the great majority possess the power of repelling them and throwing them off. They do not find that soil, so to speak, which is adapted to their growth. As we find in our fields soil within which certain grain will germinate and reproduce its kind, and other again upon which the same grain would fail to germinate, or if it did germinate would spring up but to wither and die for want of sustenance; just so we find birds, quadrupeds and persons in whom the tubercle bacillus will find ample conditions for its reproduction; others in whom this pabulum is entirely wanting; and others again in whom it is so scantily found that the bacillus, after struggling for existence for a time, is cast off, leaving the subject to regain as good health as before the invasion.

Most of the caged animals die of consumption, and the anti-contagionist would say it is because of environment. I admit that environment plays a conspicuous part in the propagation of this disease, but numerous experiments upon animals have shown conclusively that there must be more than this. Trudeau subjected a number of rabbits to similar conditions—those of confinement in damp dark places, scanty sustenance, etc., half of which number he inoculated with tubercle bacilli, and separated them from the rest; within four months all of those inoculated but one had died of consumption, and this one being killed was found to have a well developed case of it. At the expiration of the fourth month all of those not inoculated were killed, not one having died, and the most searching autopsy failed to reveal the slightest evidence of disease in a single one of them. The same number of inoculated rabbits were now turned loose on an island. They were in their native element and well fed; freedom, sunlight and all conditions conducive to health were provided. Only one of them died of consumption, while at the end of four months the remainder were by autopsy proven to be in a state of perfect physical condition.

Animals confined in museums are not only subjected to an unnatural life, but to the filth and foul odors of their cages, the dampness resulting from washing out these cages, and exclusion of sunlight, all of which are strong factors in lowering vital energy, but are hourly exposed to the tubercle bacilli, which are spat about the building and often even in the cages themselves, by the consumptive spectator, who unwittingly scatters these germs of destruction broadcast as he passes by with the eager throng of lookers on. One animal may yield to the invasion, and it is not discovered until he has impregnated that cage with germs enough to destroy every animal ever put into it, for they are passed from one to another, and will be throughout eternity, unless proper action can be taken to prevent it. These creatures in their native state never die of consumption. Roaming the wilds at will, with no shelter but the broad canopy of heaven, and warmed into animation by the glorious sunlight, that mighty destroyer of germ life, they are placed beyond the ravages of the tubercle bacillus. Just so it is with the higher order of animals.

Indians in a state of nativity seem impervious to the germs of consumption, but are now dying by thousands on the reservations. The whites and the blacks in prisons and asylums all over the world, labor under similar conditions. A report from the Illinois State Prison at Joliet says:

"There are fourteen hundred convicts within the walls, and fully one-third of them have consumption in a light or bad form. Nearly all deaths of persons in the penitentiary have been caused by consumption, and as a rule, all long termers either die within the walls from the disease or are pardoned out on account of it."

The percentage of mortality from consumption at the Georgia Lunatic Asylum is $39\frac{43}{78}$ per cent., and in other asylums and prisons it is much the same. In States where the "farming" system with convicts exists, this condition of things does not obtain. Statistics from the Georgia convict camps collected and published by my father, Dr. T. S. Hopkins, show that out of 2,803 convicts farmed out in various sections of the State between Oct. 1, 1890 and Oct. 1, 1892, covering a period of two years, there were only nineteen deaths from consumption, making a mortality of $3\frac{663}{1000}$ per cent. Now being in possession of these facts, convincing as they are, that environment plays a prominent part in the propagation of the disease, is there wisdom in congregating those already diseased, or herding together the sick and the well? There is no doubt in my mind that danger lurks in sleeping cars, in carpets, bedding, clothing and in the walls of apartments occupied by consumptives, which have not been properly renovated and rendered innocuous by antiseptic measures, and if it were not for the fact, as I believe, that the direct rays of the sun will destroy this bacillus, the inhabitants of consumptive resorts would be in far greater danger than they are from the myriads of them that are daily spat upon the streets. It is a known fact that the more nearly we approach the original man in our habits of life, the more exempt we are from disease; hence, it is apparent that isolation in the cottage system in a section of country as nearly "aseptic because it is antiseptic," as we can find, coupled with an observance of antiseptic laws will afford the most fruitful source of relief to the pulmonary invalid, and do most toward preventing contagion.

Hundreds of years have been spent in searching for a remedy which would successfully baffle this fell destroyer, whose ruthless clutches drag annually from America to eternity one hundred thousand souls, and still the search goes on. Each year serves but to convince us more fully that from drugs but little can be expected, and we can but continue, as has been done ever since the beginning of the art of medicine, to try the efficacy of climate. Ever since the days of Hippocrates, consumptives have been sent to the pine forests, as they are to-day. That the bacillus is often rendered inactive and an arrest in the progress of the disease induced by a sojourn in these pine sections is evidenced by ample proof, but how much more could we expect if these cases were

scattered through the country in cottages rather than massed in the cities and towns in crowded hotels, where they are dependent, for a part of the time at least, upon oxygen abstracted from air polluted by excretions and exhalations from the bodies of other invalids, and they themselves adding to the fruitful source of contamination.

Consumptives should be forced to provide for the destruction of sputa. Whenever situated so as not to expectorate directly into a germicide or the fire, they should use some means of conveying the sputa to the germicide or the flames. If handkerchiefs or cloths be used they should not be sent to the laundry as human happiness and life are jeopardized through the probability of inoculation through abrasions upon the hands. These bacilli should never be allowed to dry up and impregnate the air, as is now done through ignorance of possible results. Numerous experiments by leading medical authorities have proven beyond doubt that consumption is an inoculable disease, and so rapidly is the throng of converts growing that I would not be surprised if, even in my day, resorts now soliciting the patronage of the consumptive, will be quarantining against him.

TUMORS OF THE BLADDER.

Read by Invitation before the Wisconsin State Medical Society, May 5, 1893.

BY JOHN B. HAMILTON, M.D., LL.D.,

PROFESSOR PRINCIPLES OF SURGERY AND CLINICAL SURGERY, RUSH MEDICAL COLLEGE, CHICAGO; PROFESSOR OF SURGERY, CHICAGO POLICLINIC; SURGEON, FORMERLY SUPERVISING SURGEON-GENERAL U. S. MARINE-HOSPITAL SERVICE, ETC.

HISTORY.

The literature of the subject of tumors of the bladder is almost wholly modern. The ancients had a lively sense of the dangers of meddlesome interference with the bladder and although the operation of stone crushing has probably been known from the earliest times it is only since the day of Civiale and Leroy d'Etiolles that tumors of the bladder began to be commonly extirpated. According to Tuffier[1], Varner in 1750 removed a vesical polypus, but no details of the case are given. The silence on the subject is the more remarkable when we consider that instead of being infrequent among other affections of the bladder tumors are common. Sir Henry Thompson, than whom there has been no higher modern authority, relates that in November, 1880, he practiced exploratory incision in the urethra for a case which he was unable to diagnose by the methods then adopted; "most unexpectedly," he says, he found a polypoid tumor. Subsequently, in *thirty* out of *eighty* cases of digital exploration of the bladder, Sir Henry found tumor.

ETIOLOGY AND PATHOLOGY.

The causes of vesical neoplasms are very obscure, but indeed the same general observation may be made regarding tumors elsewhere. The law of Müller that all tumors consist of some tissue-type previously existing in the body holds true here as elsewhere. The tumors commonly met with in the bladder, are of the two general characteristics, malignant and non-malignant.

The malignant tumors are:

Sarcomata.
Carcinomata.

To these may be fairly added *Tuberculosis*, if we could forget that Tuberculosis is a degeneration rather than a neoplasm. The nomenclature of the Royal College of Physicians and Surgeons still classes Tuberculosis among the tumors.

The non-malignant tumors are classed by Barling:

Papillomata, Fibro-Fimbriated.
Fibromata.
Fibro-Myxoma.
Myxoma.
Adenoma.
Angeioma.
Enchondroma.
Dermoid Cyst.
Hydatid.

Watson (Int. Clinic, Oct. 1891) notes a fact remotely bearing upon causation, that (1.) Males are affected more than twice as often as females; (2.) Excepting myxoma all forms of bladder tumor occur more frequently after thirty-five and carcinoma more frequently after fifty.

Concerning the site of these tumors, Tuffier quotes Guyon as stating that on examination he found that the tumor originated as follows:

At the orifice of the right ureter 45 times per 100.
At the orifice of the left ureter 26 times per 100.
In the interspace between the ureters 10 times per 100.
The remainder were variously dispersed.

This corresponds well with Gilbert Barling's statement after inquiry into 260 cases, that two-thirds of the bladder tumors are found springing from the base. Barling is of opinion that certain of the unusual tumors occurring in the bladder, such as the dermoid cysts, may originate in the adjacent tissues and gradually make their way into the bladder.[2] He asserts that fibromata usually spring from the neck of the bladder or orifice of the ureter. It is of course known to general pathologists that fibromata must come from the connective tissue; they could not spring from the mucous structure.

The site of the myxoma while usually at the base of the bladder is not so constant.

In seventy-four cases of papilloma Barling found eleven commenced near the right ureter, and two near the left. These statistics corroborate those of Fenwick made to the Pathological Society of London in 1889, where he also asserted that the male was affected three times as often as the female, as shown in a series of 634 cases. Sixty per cent. of the cases were simple; of the single, 43 per cent. sprang from the orifice of the right ureter, to 26 per cent. from the left. Eighty-six per cent. of these growths were at the inferior zone originating at the margins of the trigone, pedunculated wholly or partially in proportion two to one; nobody has as yet vouchsafed a conjecture as to the reason for this curious fact, but the nearly constant proportion of two to one springing from the orifice of the right ureter in preference to the left, shows that some law, not accident, determines this matter.

The external shape of bladder tumors is very variable, the benign tumors having generally broad bases, and fringed or are polypiform, while the malign tumors are generally spread out, and irregular on their surface. In early cases of tuberculosis of the bladder I have often found irregularity of the surface, even where the mucous lining was as

[1] Traite de Chirurgie, Duplay and Reclus.

[2] Birmingham Med. Review, Aug., 1892, et sequitur.

yet unbroken. The volume of bladder tumors is rarely great, usually varying from the size of a filbert to that of a hen's egg. Tuffier mentions an unusually large tumor that had attained the size of the fœtal head.

But the relations of the tumors to the bladder wall must always have the highest practical interest for the surgeon, as the nature of the operation to be subsequently performed must be entirely based upon this fact as determined, whether the tumor is pedicuated, sessile, infiltrated or implanted. (Guyon.) Barling asserts that the fimbriated papillomata arise from the mucous surface by a narrow base which often forms a pedicle of some length, while the fibropapillomata arise either by a broad base or are quite sessile in their attachment and altogether more solid. True fibromata are usually pediculated.

Myomata as the name implies, are composed of muscle cells, and spring from the muscular wall of the bladder and have a wide base. The fibro-myomata spring from the muscle fibrillæ. These tumors sometimes fill up the entire cavity of the bladder and give rise to serious symptoms of vesical disease.

A brief description of the physical appearances of the more common varieties of bladder tumors will be useful in this place.

Papilloma.—Under the name of villous tumor, Rokitansky described a form of carcinomata springing from the mucous surface of the bladder growing like a cauliflower, which he called epithelial fungous. This, without doubt, is the same as those cases wherein recent observers speak of the epitheliomatous transformation; but following a less flexible nomenclature we discard the term villous, and speak of papillomata as vegetations growing as papillary prolongations from previously existing papillæ of the vesical mucous membrane. Should at any time epithelial proliferation take place the epithelial cells by infiltration crowd the other cells, and eventually supersede them; the innocent papilloma has then become a true carcinoma, and the future history of the growth is that of epithelioma, in which, owing to its poverty in connective or fibrous tissue the blood vessels are loosely supported, and hemorrhage becomes the most prominent symptom.

Unchanged and without interference, the papilloma spreads out into arborescent vegetations, gives rise to no pain, but bleeds profusely, and when the size has become sufficiently large causes spasm of the bladder after micturition. The papilloma grows slowly but without ceasing and sometimes long hair like vegetations are broken off and carried out with the urinary current. Sometimes these tumors become the seat of incrustations of the urinary salts, and the sound gives the sensation as of a stone.

Myxoma.—This tumor is composed of mucous tissue cells, is generally pediculated, and resembles the mucous polypi elsewhere; it grows rapidly and is most frequently seen in very young patients; in female patients these polypi may protrude at the meatus.

Myoma.—The myomata exist in two forms, the pure myoma composed of muscle cells and springing from the muscular coat of the bladder, and the myofibroma which more commonly takes its origin from the prostate. These tumors are capable of attaining a very large size.

Sarcoma.—This tumor is much more rare than the benign tumors or the carcinomata; its growth is extremely rapid, there is usually great hemorrhage, and considerable pain. Sarcomata of the bladder, as elsewhere is more frequent before fifty years of age than subsequently. A case of sarcoma fell under my observation at the Presbyterian hospital in Chicago, which occurred in a patient over fifty, in whom the tumor recurred to its original size within three weeks after removal. The patient is still under observation, but is comparatively comfortable. He has supra-pubic drainage.

Carcinomata.—While many varieties of carcinoma such as scirrhus and medullary are rare, epithelioma on the contrary, is extremely common. Tuffier asserts that in fifteen necropsies seen by him there were eleven cases of general carcinomatous infection. In seventy-four cases of carcinoma of the bladder, Barling found forty-seven were epithelioma and twenty-seven cases were other varieties of cancer.

All the other growths named may be said to be rare, as they are only now and then met with. Andral, Rokitansky, Klebs and Limbeck have seen cysts in the mucous wall of the bladder. Before proceeding to the general consideration of symptomatology, let me emphasize the statement that if we might include tuberculosis we should find by far the greater number of cases malignant, and even excluding tuberculosis the proportion while not so greatly in excess, is still on the side of malignancy.

SYMPTOMS AND DIAGNOSIS.

We will now consider the symptoms and diagnosis of these tumors, for, as in many other cases, an early diagnosis alone makes successful treatment possible.

There are no doubt many cases of bladder tumor that remain in abeyance or "latent" for a long period without giving rise to many pronounced symptoms. In such cases the neoplasm is not actively growing. When the tumor commences to proliferate actively the sign of hematuria is present with more or less constancy. In a vast majority of cases the first symptom which will cause the patient to consult the surgeon is hematuria, and the manner of its appearance often gives the surgeon an important clue. When the hematuria is only noticed after micturition, it may be fairly ascribed to local causes within the bladder, for hemorrhage from the kidney is usually continuous. One exception to this statement must be noted, that is when from traumatic causes there is a very considerable hemorrhage from the kidney; there is then clot formed in the ureter. This clot becomes a nearly perfect cast of the ureter, and is sometimes voided whole, or as round clots in pieces of varying length. Such clots positively prove the origin of the hemorrhage. Moreover, tenesmus of the bladder does not materially increase the hematuria in cases of kidney hemorrhage, nor is it increased by catheterism. In case of bladder tumor on the contrary, either tenesmus or catheterism will usually produce the flow. To return a moment to the coagulæ. Bladder coagulæ are always in irregular masses, and sometimes contain the debris of villous tumors, the fimbriæ of the papillomata. After a free hemorrhage from a bladder tumor there is usually a cessation of the hematuria for some time. This period is of greater or less duration according to the size of the tumor. Barling found hematuria in 162 out of 201 cases of bladder tumors, and as the first symp-

tom in 129. Papillomata were accompanied by hematuria in seventy-three out of seventy-nine cases and as the first symptom in sixty-three. Tuffier as well as Barling notes the varying character of the hematuria from day to day and hour to hour. In the morning highly bloody, in the evening the urine scarcely tinted. These cessations and these variations in quality gradually disappear with the growth of the tumor and finally there is but little daily variation, as well said by Watson, (*International Clinic*) "the hemorrhage is intermittent and progressively increases."

The source of this hemorrhage may be either from loosely supported vessel walls in the vegetations, or in rare cases by ulceration and rupture, the latter occurring chiefly in malignant tumors.

Fragments of the tumor may be frequently found in the urine, especially if there has been much hematuria. To collect them I have directed that the urine should be filtered through gauze, which may then be examined with a low power. It is exceptional, however, that these fragments will show completely the morphology of the tumor. That there are fragments at all show that the tumor is of the villous character. Recommendation has been repeatedly made for washing out the bladder in order to bring with the outflow as many of these fragments as possible. To this practice David Wallace, in a paper read before the Medico-Chirurgical Society of Edinburgh December 7, 1892, objects that "the plan is useless because these fragments are often retained in the bladder for some time and are macerated, and thus allow of no conclusion; secondly, it is dangerous on account of the risk of setting up a hemorrhage."

Pain and Irritability.—Pain, which is frequent in the latter stages of bladder tumors, is very commonly absent in the beginning, but it progresses equally with irritability. In a small proportion of cases pain is the earliest symptom. Barling, in his admirable article already quoted, says "frequent micturition and pain either separately or together, may first attract attention. Such was the case in ten out of seventy-six cases of papilloma and eighteen out of thirty-nine of other innocent growths, seven out of twenty-two sarcomata and twelve out of sixty-four carcinomata—in all forty-seven out of 201 cases." "It will be seen," says Barling, "that these two symptoms, more commonly than the hemorrhage, indicate in the first instance the presence of a *firm* growth such as fibro-myoma or fibro-myxoma."

When the bladder becomes nearly filled with the tumor, then there is not only the pain due to the growth, but violent tenesmus, with frequent micturition. By abdominal palpation we may learn something and indeed gain very definite information if we conjoin the external palpation with the rectal or vaginal touch. In the male the finger in the rectum, while the other hand is pressing the hypogastrium, gives full information of the size of the prostate and of any irregularities that may be present in the bladder wall. The catheter or sound may also be used with one hand, while the finger of the other makes the recto-vesical exploration. In the female the tumor, unless attached by a very narrow pedicle, may be felt through the anterior wall of the vagina with great ease. In sounding the bladder, antiseptic precautions should be taken by requiring the instruments to be boiled before using. In case it be deemed expedient to distend the bladder, a solution of boracic acid 4 to 100 may be used, but it must be remembered that the bladder should be entirely empty to obtain the full benefit of a bimanual examination. Barling, who praised highly this form of examination, recommends that during this examination the fixation of the bladder to surrounding tissues, if it exist, should be noticed, and as well the lumbar and pelvic lymphatic glands, for the purpose of gaining information regarding the malignancy of the growth, or otherwise.

The cystoscope, which in the hands of Nitze, Leiter and Fenwick has given such excellent results, will be found of little value in general practice, although of so much value to those expert in its use. The obscuration of the cystoscope window by mucus from the urethra or bladder is quite frequent, and in case of hematuria the obscuration may be total. It is well, however, to try the instrument, because in some cases a clear view may be obtained. To render the instrument aseptic it should be immersed in a weak solution of carbolic acid for ten minutes before using. Watson recommends that the bladder should be washed to clear it of mucus before using the cystoscope, and that the capacity of the bladder should not be less than five ounces and some clear fluid contents should remain in the bladder. It is proper to state that as the modern cystoscope is essentially a hollow tube with an incandescent beak, this beak becomes extremely hot if burned in the air, but in urine or water remains cool. The cystoscope can not therefore be used in an empty bladder, nor can the beak be allowed to touch the mucous membrane. Moullin (Treatise on Surgery, 2d American Edition) has pointed out that even under the most favorable conditions the visual field of the cystoscope is very limited; "that only a minute part of the bladder wall can be seen at one time, and that even with the naked eye, when the bladder is laid open, it is not always possible to be certain as to the clinical features of a minute growth. Natural rugosities of the bladder wall, low villous growths of an inflammatory character such as are not unfrequently met with in cases of calculi, prolapse of the ureter and many other conditions, present a closely similar appearance."

Watson asserts that in favorable conditions it can be decided with the cystoscope whether the growth is pedunculated or sessile or has an ulcerated surface. When ulcerated, with raised, ragged or œdematous edges, the probability is that the tumor is cancerous. "The fine villous projections of the papilloma often give a most characteristic and beautiful picture. . . . The condition most likely to be mistaken for a bladder tumor is the projecting portion of a hypertrophied prostate, and this is especially true when its surface is occupied by granulation tissue, but the position of the growth, the detection by rectal touch of the hypertrophied prostate, and the history of the case will usually make its nature clear." Incrustations also may be detected by the cystoscope. It has already been mentioned in this paper that bladder tumors where greatly projecting frequently become incrusted with phosphatic deposits to an extent that sometimes causes them to be mistaken for stone.

Dittel, *Weiner Medicinsche Wochen*, Nov. 24, 1892), gives another instance in which cystoscopy fails, that is in presence of acute nephritis or pyelitis, and also

in cases where the capacity of the bladder is so small that its expansion is impossible. Finally, it may be said for the cystoscope that in favorable cases it gives very material light on the question of the best route for removal of the growth. Fenwick, an enthusiast on the subject of the cystoscope, and whose own instrument is one of the best, asserts that as between that instrument and the "Boutoniére périnéale" as a means of diagnosis, he had negative results twice in forty-three cases of cystoscopy and fourteen negative results out of forty-three by the boutoniére périnéale. It will be remembered that this operation was the favorite method of Sir Henry Thompson.

Dr. A. F. Norton, (*Medical Press and Bulletin* 1892) has tabulated a diagnostic summary between tumors and calculi, as follows:

TABLE A.—DIAGNOSIS.—(NORTON.)

	Tumors of Bladder.	Stone in Bladder.	Stone in Kidney.
Blood . .	Large clots	Clots in shreds . .	Mixed freely with urine.
Mucus . .	Often none	Always present . .	None.
Pus	None	Quantity corresponds to amount of mucus.	Pus present in quantity with little or no mucus.
Irritability of Bladder.	None unless tumor enters urethra.	Great	Depends on presence of pus.
Pain . . .	None unless in region of meatus.	Always marked and extending to perineum.	Pain in one or both loins.
Sound . .	Occasionally slides over soft tumor.	Detects stone. . . .	No result.
Cystoscope	Detects tumor unless much blood.	Detects stone. . . .	No result.

Exploratory Operations.—The boutoniére périnéale originally proposed by Sir Henry Thompson, and followed by Whitehead, consists in making incision externally into the membranous urethra, then passing the finger into the bladder through the prostatic urethra, and making digital exploration. The idea evidently sprung from the fact that the bladder could be easily explored in the female through the short urethra. This operation is contra indicated in very fat persons and those in whom there is great enlargement of the prostate.

We may now summarize the general diagnosis: We must make the diagnosis from renal disease, renal calculus, cystitis, vesical calculus, vesical varicosities, and hemophilic hemorrhage. To exclude renal disease and tumors of the kidney we must make careful physical exploration of the kidney by ballottement, and abdominal palpation, and chemical examination of the urine; we may exclude tumor from renal calculus by the history of the case, which would show a record of renal colic, ceasing on passing of the stone, and the blood following the cessation of the pain. During the continuance of the colic there is usually severe pain in the glans penis. Renal colic is absent in cases of bladder tumor. The sound will easily detect the presence of vesical calculi, excepting the cases of incrustations which as already mentioned are best detected by the cystoscope. In cases of stone the hematuria is not usually increased by the operation of sounding, nor is the hemorrhage as severe in stone as in cases of tumor. Varix of the bladder is extremely rare and may be detected by the cystoscope. In cystitis there is less hematuria, the pain is more acute, the tenesmus is more frequent, and palpation shows little thickening or infiltration of the bladder wall. Hemophilic bleeding is usually accompanied by hemorrhages elsewhere, or accompanied by the scorbutic cachexia; certain idiosyncrasies of the patient may also cause parenchymatous oozing, and finally vicarious menstruation from the bladder may take place, in so small a proportion of cases, however, as to render this circumstance scarcely worth consideration.

Progress and Prognosis.—Enough has been said of the general character of bladder tumors to show that while they follow the same general rules applicable to malignant and non-malignant tumors elsewhere, yet the benign tumors destroy life by repeated hemorrhages almost as certainly as the malignant tumors cause death by the natural progress of the growth. The danger of the epithelial substitution even in the most benign neoplasms, is always to be considered. Occasionally the simpler non-malignant tumors may remain in the bladder for several years, without other symptoms than infrequent light attacks of hematuria, and there is always amelioration of the symptoms after expulsion of fragments. Other varieties rest quiescent for a long time without giving rise to any very pronounced symptoms, when they suddenly develop with extreme rapidity and progress to a fatal termination. Sarcomata and carcinomata rarely extend beyond a period of three years, usually causing death within that time. (Albarran.) Barling's tables gives the average duration of life in cases of papilloma at a little over six years; two-thirds of twenty-five cases in which there was no interference died before the expiration of five years.

TREATMENT.

The medical treatment of bladder tumors, as may be well supposed, is of little avail. The internal hemostatics such as ergot, gallic acid, tannic acid, and aromatic sulphuric acid have been recommended in cases where patients refuse operation, for the lessening of the hematuria. To relieve the spasm, lavage of the bladder with antiseptic solutions is recommended. The clots should be frequently washed out.

Operative interference may be divided into the palliative and radical treatment. The palliative operations consist in perineal section or supra pubic cystotomy. As between the two methods I very much prefer supra pubic cystotomy. This operation which is also extremely useful as a palliative in cases of tubercle, gives great relief in all cases and especially in sessile tumors and as well in the inoperable ones. Spasm of the bladder is surely prevented whenever a free outflow of the urine is secured, and many a patient hopelessly diseased is made comparatively comfortable by this operation. The application of caustics or antiseptics is made easier by having a free opening, through which they may be made. Efficient drainage, always an important factor in treatment may be secured by either method but the perineal method has always the disadvantage of occasional, sometimes frequent prostatic obstruction.

The radical or curative treatment consists in the use of the same two routes of reaching the bladder, but occasionally where a large opening must be made in the bladder the supra pubic operation is made at two sittings (a deux temps). At the first operation the bladder is reached and stitched to the wound, which in two or three days is sure to be extra-peritoneal. At the second operation the bladder is

opened either by the Paquelin cautery or the scissors, and the tumor dealt with. The treatment of the tumor consists in avulsion by forceps, curetting, cauterization or extirpation by the knife. For tumors with a pedicle, nothing is easier than avulsion, but these tumors constitute a relatively small proportion of those encountered, which are generally sessile. The use of the sharp spoon followed if necessary by the Paquelin button will be found most available, and most frequently used. The ligature is used by some surgeons in preference to torsion in cases of pediculated tumors. The cases that may be considered as inoperable are those in which there is glandular infection, fixation of the bladder, infiltration of bladder wall and surrounding tissues.

Symphysiotomy to reach the anterior wall, recently proposed by Albarran, and Wickhoff of Vienna, seems to me a cruel operation, and, so far as I can judge, an unnecessary one.

The statistics of operations are sufficiently favorable to warrant the recommendation to operation in all classes of tumors, if done early, and in cases of non-malignant tumors at any stage but the earlier the better.

Dr. Phocas, in a paper read before the French Congress of Surgery, at Paris, in 1892, has made the following table of tumors of the bladder in children, a study of which will be found interesting, but the mortality is much greater than in adults:

TABLE B.—BLADDER TUMORS IN LITTLE GIRLS.

	Index of Bibliog.	Age of Patient.	Beginning.	Functional Symptoms.	Physical Symptoms.	Nature of the Operation.	Nature of Tumor.	Results.
1	Vincent, Lyon Med., p. 264	9½ yrs.	15 days	Incontinence of urine	At the level with the incised vagina was found a tumor, with reddish to green surface, smooth and size of walnut	Division of the pedicle by thermo-cautery	Cyst	Recovery.
2	Pfenninger, Wurtemberg Med. Corr. Blatt, No. 23, 1834	34 mos.			The tumor made a projection through the urethra of the form of a strawberry	Dilatation of the canal and ligature of the tumor. After this first operation there was found by rectal touch and sound another, but removal was not attempted.	Papilloma (?)	Death from peritonitis.
3	Birkett, in Med. Chir. Transact., 1858	5 yrs.			Polypus coming out through urethra	Ligatured with silk		The child very weak, dies.
4	Bryant, Brit. Med. Jour., May, 1879. Operation performed in 1864	3 yrs.		Hematuria		Ecraseur		Recovery, preserved 8 years afterward.
5	Pfenninger, Schmidts Jahrb., 1834, Vol. iv, p. 300	3 yrs. & 9 mos.			Tumor appeared at genital parts and obstructed urethra	Excision of the tumor		Death.
6	Guersant, Gaz. Hop., No. 23, 1868	22 mos.		Frequent micturition	Polypus coming through urethra	Slitting up the urethra with the scissors to reach the pedicle, which was closed off by the ecraseur	Sarcoma	Gangrene of the vulva. Death eighth year.
7	Geraldès, Affections Chir. des Enfants, 1869	2 yrs.			Polypus coming through urethra	Excision of tumor	Sarcoma	Death.
8	Smith, Brit. Med. Jour., 1872, Vol. ii, p. 64	4 yrs.					Medullary cancer.	Death.
9	Patterson, The Amer. Jour. of the Med. Sciences, April, 1882, p. 464	19 mos.		Very frequent desire to urinate, and very great pain before and after. One time only a little blood in the urine	Tumor coming out at urethra	Ligature. Another operation after. Removed two or three tumors surrounded by an infinite number of small ones		Without improvement. Death six months afterward. At the autopsy, a tumor as large as hen's egg on the posterior wall of the bladder.
10	Howard Marsh, Trans. Path. Soc.	2 yrs.	1 yr.	Slight hematuria. Retention of urine	Tumor coming from vagina	Ligature. Appearance of new excrescences.	Sarcoma	Death 16 mos. after first intervention.
11	Shattock, Brit. Med. Jour., I, 1883, p. 15			Obstruction of urethra by a prolongation of the tumor				Death from exhaustion.
12	De Saint-Germain, Rev. mensuelle des mal. de l'enfance, 1883, p. 43	7½ yrs.	1 mo.	Incontinence of urine	Tumor coming through urethra		Myxoma	Death.
13	Owen, Malad. chir. des enfants, trad. Laurent, 1891			Severe spontaneous pains. Incontinence	At urinary meatus, polypus mass, lobulated, red, and of the size of a strawberry.		Myxoma	Death.
14	Albarran, Tumors of the Bladder, 1892. Guyon et Albarran.	4 yrs.	7 mos.		Appearance of tumor at the vulva	The urethra, dilated by the tumor, permitted seeing that the tumor, which came from vulva, was situated in the neck of the bladder. All around the neck, and disseminated through the bladder, neoplastic growths were felt. Ecraseur.	Myxoma	Death 40 days after.
15	Buttlin, Lancet, 1882. Quoted by Albarran.	4 yrs.			Fungous growth coming from urethra	Extirpated through urethra	Sarcoma	Rapidly returned.
16	Tewert, Billroth, Deutsch ch., 71	3 yrs.			Projecting through urethra	Extracted through urethra	Sarcoma	Returned. Cystitis, Peritonitis, Pyelo-nephritis.
17	Albarran			Guyon's case, without history. Tumor having the appearance of a nasal polypus.				

TABLE C.—BLADDER TUMORS IN BOYS.—DR. PHOCAS.

	Index of Bibliog.	Age.	Date of Commencement.	Principal Symptoms Observed.	Size. Place, etc.	Operation.	Nature of Tumor.	Results.
1	Deschamp, 1794, Encyclop, des. Sc. Med.	12 yrs.	....	The patient had a stone. Tumor was recognized in course of an operation . . .	.....	Cystotomy	Fungus	Recovery.
2	Gross, 1825. Quoted by Geraldes	2 yrs. .	....	Stone. Tumor found during operation . .	.....	Cystotomy	Polypus	Death. Leafy polypus tumor.
3	Stanley, Lond. Times and Gazette, July, 1852. Quoted by Wien	30 mos.	....	Micturition incomplete	Tumor situated under orifice of l. ureter . .	.....	Polypus	Death.
4	Savary, Med. Times and Gazette, 1852, Vol. ii	18 mos.	....	Vesical symptoms, as from a stone	Polypus growth implanted in mucous membrane back of uretral orifices . . .	.....	Polypus tumor . . .	Death.
5	Gross, 1834, Treatise on formation of urinary calculi . . .	2 yrs. .	....	.....	.....	Median cystotomy. Only superficial parts of tumor removed. A very extensive base prevented going farther in operation . .	.....	Death in about 44 hours.
6	Gussenbauer, Archiv. f. Klin. Chir., 1875; 2nd ed., p. 411, Billroth	12 yrs .	....	Rational symptoms of stone, which led the surgeon to an error.	.....	At first a perineal cystotomy; then, on account of the size of the growth, a hypogastric incision . . .	Myxoma	Recovery 1 month after operation.
7	Charon, Bull. Acad. Med. de Belgique, 1878	3 yrs. .	....	Symptoms of stone .	.....	Bilateral cystotomy .	Myxoma	Death 15 days after operation.
8	Owen. Med. Times and Gazette, 1885, Vol. ii. p. 212	....	....	Pains in the hypogastrium. Retention of urine	Neck and floor of the bladder	Cystotomy	Sarcoma	Death.
9	Ditarch, Prager Med. Woch., 1889. No. 48 .	21 mos.	....	.....	Base of bladder . . .	.....	Spindle-celled sarcoma	Death.
10	Marshall, Encycloped. Internationale . . .	1½ yrs.	....	.....	.....	.....	Myxoma	Death.
11	Villnze, Virchow and Hirsch, 1887, Vol. 1, p. 275	13 yrs .	....	Hematuria. Retention	.....	.....	Myxoma	Returned 2 years after. Death.
12	Albarron, 1889, M. Guyon	5 yrs. .	....	Hematuria	.....	Supra-pubic cystotomy. Extirpation by galvano-cautery . .	Polypus, taking on epithelial growth .	Returned 2 years after. Recovery.
13	Phocas	6½ yrs	15 days	Incontinence	Infiltration	Supra-pubic cystotomy	Myxo-sarcoma . . .	Death 5 mos. after operation.
14	*W.D. Spanton, Trans. Path. Soc. London, Vol. xlii, p. 218 . . .	5 yrs. .	....	Dysuria. No hematuria	Size of man's fist. Springing from prostate	Supra-pubic cystotomy	Myxo-sarcoma . . .	Died 13 weeks after dysuria first observed.

*Added by me.—J. B. H.

WORKS CONSULTED IN THE PREPARATION OF THE FOREGOING PAPER.

Stein: A Study of Tumors of Bladder. N. Y. 1881.
Thompson: Dis. Urinary Organs, 8th Edition. Philad., 1888.
Tuffier: Art. dans. Traité de Chirurgie par Duplay et Reclus. Tom. vii, Paris, 1892.
Ricard and Bousquet: Traité de Pathologie Externe 2d Ed. Paris, 1893.
Watson: Internat. Clinic. Phila., 1891, iii, 175-183.
Southan: Brit. Med. Jour. London, 1892, ii, 942.
Dittel: Wein. Med. Wochenschr. 1892, xlii, 970.
Wallace: Edinb. Med. Jour., Feb., 1893.
Perregaux: Arch. Gener. de Med., Jan., 1893.
Jewett: Med. Press and Circ. London, 1892. N. S., 123-126.
Norton: Med. Press and Bulletin, 1892, p. 123-126.
Guyon: La France Med., May 13, 1892.
Barling: Birm. Med. Review, xxxii, 65, 145, 205.
Spanton: Trans. Path. Soc. London, vol. xlii, p. 218.
Kelly: Univ. Med. Mag. Philad.

CONSUMPTION PRIMARILY A NERVE DISEASE.

Read before the Illinois State Medical Society, May, 1893.

BY J. J. M. ANGEAR, B. S., M.A., M.D.,

Professor of Physiology, Nervous and Mental Disease in College of Physicians and Surgeons, Keokuk, Iowa.—Professor of Physiology and Pathology in United States Dental College—Surgeon of the Columbian Accident Company—Attending Physician National Temperance Hospital—Member American Medical Association—Illinois State Medical Society—Chicago Medical Society—Chicago Pathological Society—Chicago Academy of Sciences—Ex-President Chicago Pathological Society, etc.

I have for years entertained the idea that the initial lesion or vice causing consumption is in the nervous system. In January 1880, I read a paper bearing the title "Consumption a Nerve Disease" before the Iowa State Medical Society.

Causes of all diseases may be divided into internal and external.

External causes arise from the patient's environments and are generally called exciting causes.

Internal causes are congenital or hereditary defects or vice. This is generally termed predisposing causes. Primary cause here is meant some abnormal condition of the nervous system, which may arise from the patient's environment or heredity and from this defect arises the anatomical lesion and the pathological vice producing the symptoms which we call phthisis pulmonalis.

We wish to emphasize the thought that the force of the external and the internal causes are spent upon or aimed at the nervous system. At this particular time there may be no evidence or symptom of disease of any kind. Any one of the environmental factors may be actively operative and cause some other disease than consumption. Lying upon the damp ground may cause meningitis in one, myelitis in another, rheumatism in the third, inflammation of the lung in the fourth and consumption in the fifth. Because the environments may or may not cause consumption it cannot be stated to be *the* cause.

The active internal cause depends upon the external and if the patient can be excluded from the external cause then the patient is shielded or exempted from the disease, hence both the predisposing and the exciting causes are conditional, therefore I have seen fit to name the defect or lesion in the nervous system—which is always present and always antecedent and active in causing the symptoms—the primary cause of consumption. When the nervous system is thus affected consumption and not some other disease is inevitable.

I am not going to deny the existence of the bacilli tuberculosis—that they can be cultivated and in some cases by injection the disease may be produced. I wish to show that there is a something acting as a cause which antedates the introduction of the bacilli as a cause.

Since the discovery of the bacilli, too many of the

profession have jumped at the conclusion that the bacilli are the prime and only cause of phthisis. This conclusion has prevented the profession from investigating the matter as to the proper place the microbes occupy as a factor of the cause of phthisis.

If these microörganisms are in the expired air of the consumptives and the atmosphere is thus contaminated why, then, are not all of us affected?

Consumptive children are in our schools, consumptive persons are in our street cars, are on our boards of trade, in our public halls and in our churches. The sputa of consumptives are on the floors and in the spittoons of all our public places; therefore we must be breathing this contaminated air. Their sputa-soiled handkerchiefs and clothing are sent to our common laundries—with all this excessive exposure we have but one consumptive in 573 of the population of Chicago. Were this theory true, instead of wondering why so many persons die annually of phthisis, the real wonder is why so many live.

Measles and scarlet fever are said to be caused by microbes. It is an historic fact that on the Faroe Islands no measles existed from 1781 to 1846, a period of 65 years. At the expiration of which time it was introduced by a single patient. Out of a population of 7,782 only 1,500 escaped the disease. Those who escaped were mostly over sixty-five years of age and had had it in childhood. The historian does not tell us how many of the 1,500 who escaped had had the measles in childhood. He says mostly—showing that there were but few who escaped having measles. Let us take the figures as they are, and they give us the fact that 80 per cent of the population were smitten with this disease. Had it been scarlet fever or small-pox the result would have been the same.

Now if consumption is of the same microbic origin, in the city of Chicago, a population of 1,250,000, instead of having, as we had last year, 2,182 deaths from consumption, we should have had just 1,000,000 deaths. There would have been but a mere handful left to tell of the devastation of the wonderful World's Fair city. To say the least, this shakes our faith in the theory that the bacillus is the primary cause of consumption. This is not denying that the microbe may be a factor, but not the prime cause.

Since the introduction of the theory of the microbes causing phthisis, the profession have been spending their energy in trying to kill the bacilli, believing when that can be done the disease will be cured. Hence the intestines have been the battle ground, and the microbes have been bombarded with sulphuretted hydrogen.

Just call to mind the amount of paper and ink that has been wasted in extolling the wonderful discovery that has cured so many cases—and according to some of these wonderful reports it has cured all. Literally blowing up their patients and stinking out the inhabitants of the home. Where are all these cured patients? "Their stammering tongues lie silent in the grave." Where are those doctors and their stink pots? The microbes echo, where!

Then came the hot air fad. These pestiferous microbes must now be burned up. The lung now becomes the battle ground. The manufacturers could not make the necessary furnaces fast enough to supply the demand. The zealous M.D. could be seen like the plumbers going along the streets with their furnaces; the one to solder and the other to roast. The plumber is the victor and now has the entire field to himself. Where are all these patent hot air furnaces? Where are the cured? Where the doctors? You, Diogenes-like, may light a candle and search Chicago without finding one. The cured patients have quietly folded their tents and stolen away—to the great hereafter.

Then came the grand idea of attacking the little but numerous demons with sodium and gold by means of the hypodermic syringe, and thus attack the microbes in the blood and other fluids of the body, and this too has been reported as a grand success, and yet Father Time had written on the historic page of 1892, in Chicago 2,182 patients have died of consumption in spite of the little syringe loaded with sodium and gold.

The failure of all these well aimed (according to the theory) and thoroughly executed plans, should open the eyes of the profession, and at least shake their confidence in the theory that killing the bacilli tuberculosis is going to cure their consumptive patients.

Not breaking new ground in physiology nor pathology, but simply referring to well known principles, it will not be necessary to load down this paper with references to authorities. Many mathematical principles and historic facts are so well understood that referring to authorities would weaken rather than strengthen a paper, besides insulting the intelligence of the reader or listener.

Correlation of nervous diseases is well understood and accepted by the profession.

Wetting the bed in childhood may develop, as the child grows, into spermatorrhœa.

An hysterical woman may beget an epileptic or a choreic child.

An epileptic parent may beget an idiot, or a child that may become insane or consumptive.

A neurotic parent may beget a morally depraved child that may spend the major part of his life in jail, penitentiary, or die on the gallows. I have seen from a consumptive mother an epileptic daughter, a morally depraved son, and another daughter who died of consumption.

A large proportion of the insane die of pulmonary disease. Among these the insanity gets better as the phthisis gets worse, and *vice versa*.

Severe exposure is a fruitful cause of myelitis, meningitis, neuritis, as well as consumption.

Injuries, especially of the hands and feet, frequently produce tetanus. I have known it to cause phthisis.

These examples suffice to show what is meant by correlation of nervous diseases, and at the same time show that tuberculosis may be correlated with nervous diseases. This proves that there is an intimate relation between consumption and nervous diseases.

Nutrition is under the control of the nervous system, and the nerves whose function is to govern nutrition we call trophic nerves. Consumption is a wasting disease. The body is not nourished and finally succumbs to destructive metamorphosis. The logical conclusion is that consumption is a disease of the trophic nerves.

Self preservation is a fundamental law of nature, not simply in the animal as a whole, but in the tissues and even down to the minutest cell of which the body is composed. Nature is able to resist a certain amount of destructive influences. The mechanic's

hands become hard by honest labor, and thus resist a great amount of friction. That is not saying that a mechanic's hands can not be blistered by friction and that slivers can not penetrate them.

The blacksmith can handle hot iron—so hot that it would burn others. Yet blacksmiths may have burned hands. Men chew and smoke tobacco to a certain extent and live to a good old age, because they do not go beyond the limits of natural ability to resist these baneful influences. These men may step over the line and suffer from the effects of the nicotine.

Resistance or endurance is a known physical principle, and may be natural or acquired. The pigeon can take enormous quantities of opium. The hog will get fat upon arsenic. Some persons never have measles or scarlet fever. These are examples of natural resistance, while the taking alcohol, opium, tobacco, etc., are acquired.

Dr. Paget had worked for years upon the cadaver and paid no attention to cuts upon his fingers or scratches on his hands, because he had an acquired resistance to the virus, microbes, ptomaines, etc., but in later life he abandoned his work among the dead, and in after years he attempted a post-mortem and nearly lost his life; was very sick for a long time with blood poisoning. This shows that an acquired resistance may be lost.

Resistance is positive; susceptibility is negative. Destroy resistance and you establish susceptibility. A puerperal woman is susceptible to scarlet fever and erysipelas. The puerperal state has destroyed the resistance.

Nature furnishes scavengers in the form of flies, crows, vultures and jackals; the carnivorous animals to keep in check the too rapid increase of other animals which would overrun nature and thus bring a total destruction of all living things. The cat checks the mice, the wolf keeps down the rabbits, the hawk prevent the too rapid increase of the pigeons, the sparrow saves our shade trees by devouring the destructive worms.

The leucocytes do this work for us in our bodies. Your catgut ligatures are removed by the carnivorous leucocytes. A sliver in the flesh causes congestion, brings a whole army of leucocytes in the vicinity, and they loosen the sliver by enlarging the cavity in which it is lodged. These faithful leucocytes as sentinels attack the microbes and eat them, and thus save us from the effect of the bacilli tuberculosis.

While the trophic nerves are normal, producing or recruiting and keeping up the ranks of these leucocytes, we are saved from consumption. The microbes are the rats while the leucocytes are the ferrets, and while the ferrets are healthy, vigorous and sufficiently numerous, we have a resistance to consumption.

While the nervous system is normal the blood making process goes on, the various functions of the body are correctly performed. In this condition a person breathes the air from the lungs of a consumptive patient. The bacilli are few in number and the healthy person receiving the microbes has an active and vigorous army of leucocytes, and the battle is sharp but decisive. The leucocytes are the victors. Let us suppose a wife has been watching and caring for a consumptive husband for a long time, depressed mentally, anxiety wrought up to the highest pitch, there has been loss of sleep. Here is a chain of causes which will break down the nervous system enough to cause serious nervous and mental disease. There is a loss of appetite, impaired digestion and wasting of all the tissues. In this condition she is taking in the air which is loaded with the bacilli tuberculosis. The leucocytes are greatly reduced in numbers and strength. In the battle the bacilli are the victors. They multiply rapidly and reign supreme until the death of the patient.

There was a point in this patient's history had she been placed in an atmosphere destitute of the bacilli and before resistance had been destroyed, when the nerve energy would have been recuperated, appetite, digestion and nutrition would have been restored and the patient might have been saved.

Confinement in prison causes great mental depression and worry, and this causes the majority of the inmates of prisons to die of consumption.

It is reported that two-thirds of the prisoners at Joliet have consumption, and nearly all the deaths that occur in that institution are of phthisis. Living in dark, damp houses will do the same.

If we ever expect to cure consumption we must do something more than fight microörganisms, which at best is but cutting off the tops of the Canada thistles and leaving the roots in the ground.

We are recognizing to-day the fact that the nervous system with its fibers going to every organ, every tissue and every cell in the body, governing and controlling every action and every function in the grand and wonderful structure of the human body, when it is attacked by disease digestion fails, absorption fails, assimilation fails, and the very citadel of life fails. The King of Terrors rides triumphant through all and over all.

EXPERIENCES WITH SCABIES.

Read before the Section of Dermatology and Syphilography, at the Forty-third Annual Meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY ELISHA CHENERY, M.D.,
OF BOSTON, MASS.

So long as scabies remains the important disease that it is—actively contagious, at times difficult of diagnosis and also of treatment, being often dovetailed into the community where it is found—so long is it a subject worthy of our consideration. What I have to relate bears upon the foregoing statements.

Some years ago I entered upon a country practice where there had been a well-trained and able physician. How he missed certain cases of the itch I do not know, unless it were from the fact that they occurred in the foremost family in town, who were unwilling to admit that they could have the itch. Said the mother to me, "I thought it was poor folks that had the itch." I replied that the mites liked rich folks just as well, only their more liberal use of soap was in the parasite's way. In this family the father, who was at home but little, escaped. The mother, the grandmother, and four daughters were all affected. The irritation on the grandmother was very great, producing blebs, boils and abscesses. After a little, I succeeded in prevailing on them to use the usual remedies, and with success. The grandmother's case alone would have been difficult of diagnosis on account of its complications. As a whole they demonstrated that scabies is no respecter of persons, and that under certain circumstances, the disease places the physician at a disadvantage to cope with it.

A man, lately from the war, was greatly annoyed

by an itchy condition of the skin, yet showing but little eruption. He went to the ablest physician in the regions, who pronounced the disease the *army wildfire*, and prescribed for it. The remedies not putting the fire out, I was summoned to the house. When the other members of the family were brought up, there was no difficulty in making out what the trouble was with him. Insecticides were prescribed with the usual results. The first physician saw only the father and therefore did not have the opportunity that I had, moreover it was at the time when lichen was very prevalent, and that would not yield as readily to remedies as the itch.

The contagiousness of scabies is eminently illustrated in the following: A clergyman whose family had grown up and gone from home, feeling lonely, went to an eleemosynary institution and took out a girl to racket in his house. This clergyman had drifted into the tide with other Methodist ministers, and gave his influence in favor of the fashionable New England fad, homœopathy, and had the impudence to call me a fool because I would not swear on Humphrey's specifics. Such people are self-deceived and are sooner or later likely to betray their ignorant conceits. It was so in his case. The orphan he brought home had an eruption which he assumed to be the scrofula which he plied with his favorite specifics. Neighbors visited his house and caressed the child. He carried the child with him into nearly all the families in his parish where it was petted and caressed. At length the leading families required my services for the itch, referring the cause to that child. And it was no small setback he received when he found, that through his ignorance of medicine, he had spread the itch throughout his parish, nor was it difficult for me to show whose foot the fool's shoe fitted. Ministers' mouths should not be open concerning medicine when the highest they can swear by is by Humphrey's specifics.

When I was a student with my preceptor in this city, forty years ago, we had a pretty large swing through the North End, he being dispensary physician to a district in that part of the city. At that time Dr. Silas Durkee was giving instruction to a private class on dermatology, and requested my preceptor and myself to let him know if we found any cases of scabies. He said it was one of the rarest skin affections in the city. We did not find him a case, but had invitation to his office to see one which he had elsewhere found. It was in a girl of sixteen, had lasted seven years, and was the only case of the *seven year itch* I ever saw.

Since that time there has been a great change, with respect to this disease in this city, and the various dispensaries are annoyed by the frequency of the cases of it. I have been connected with the North End work for the last year or two and have been particularly impressed with its prevalence among the Italian and Jewish peddlers. They seem not to have a consciousness of the nuisance they are to the community, and that they are spreading the parasite into well-to-do families by their trade; for they go from house to house, undoing and exhibiting their cloth and other wares for the people to handle, when they are themselves alive with the pest.

In the country there is a larger degree of moral sense and the physicians are fully capable of handling the disease. In the city it is otherwise. Though he cure a few cases he can not usually get to the depth of the cause, in the rags and squalor in which the poorer people live. Hence there is need of organized action. The boards of health are, as a rule, the only competent parties to ferret out and destroy the parasite among the foreign people and in the densely crowded quarters; and this should be an element in their business. Scabies should be put among the diseases with which they deal, should be reported to them the same as measles are, and they should go at it with disinfectants as they do at other infectious diseases. Nothing short of this can rid our densely crowded quarters of the infecting pest. And moreover they should add to this, thorough disinfection, a critical examination of immigrants, and prevent the landing of any who are subject to the disease, till they have gone through the proper course for cleansing. The important nature of the affection demands this action; and unless it be done our immigrant cities must be and remain hot-beds of infection of this kind to our own and better people; for it is impossible that any private physicians can do this work.

MYXOSPORIDIA IN THE COMMON TOAD WITH PRELIMINARY OBSERVATIONS ON TWO CHROMOPHILE SUBSTANCES IN THEIR SPORES.

A. P. OHLMACHER, M.D.,
OF CHICAGO.
PROFESSOR OF EMBRYOLOGY, COLLEGE OF PHYSICIANS AND SURGEONS, PROFESSOR OF PATHOLOGY, CHICAGO POLICLINIC.

The myxosporidia belong to the class sporozoa (Leuckart), a sub-division of the sub-kingdom protozoa. The sporozoa are unicellular parasitic organisms, obtaining their nourishment by the absorption of the liquids of their host. This class of parasites is particularly interesting to the pathologist at the present time, because of their supposed causative relation to carcinoma and other neoplasms. The classification of the sporozoa lately adopted by Braun is that of Mingazzini, who divides them into four groups:—1. Gregarinida (including coccidia). 2. Myxosporidia. 3. Sarcosporidia (including microsporidia). 4. Hæmosporidia. From this it will be seen that the myxosporidia form a separate group of the sporozoa, having been set aside in this manner because of certain characteristics peculiar to themselves; and in this grouping, the principal feature which distinguishes the myxosporidia from other sporozoa, is the presence of thread-like flagellæ in their spores.

The life history of most of the sporozoa is still obscure, though the labors of many investigators in this important field are gradually widening our knowledge. A very striking peculiarity in the biology of these lowly animal forms is the complexity of their development. In the development of a species of the group gregarinida, for instance, there are described no less than the *seven stages* in its metamorphosis. In the so-called "pseudo-navicella" stage, and in the "crescentic germ" stage, in the development of the sporozoa, protoplasmic particles are produced by the segmentation which are of extreme minuteness; and in this condition their examination, even with the highest power of the microscope, is extremely difficult. This difficulty of observation is the case where these organisms are studied free from the tissues of the host, and naturally, it must

be much increased when these bodies lie in the tissue elements. Without going into a discussion of the sporozoa as a whole, we may refer the interested reader to the work of Leuckart; and to the reviews of Wright, Kruse, Lindner, Braun; and to the special paper quoted in these works.

The myxosporidia, or psorosperms as they were formerly called (Leuckart, Lieberkühn), are parasitic throughout a large range of the animal kingdom. Korotneff describes myxosporidia in a species of bryozoa. Thélohan, Henneguy, Garbini, and others, found these parasites in a variety of crustaceans, both inland and marine. In amphibia the myxospordia have been studied by Leukart, Lieberkühn, Lutz, and others. The "psorosperm disease" of a large variety of fish has long been recognized, and the parasite described. In these animals the parasites have been found both on the external surface, and in the various organs of their host, and a variety of lesions have been produced by their agency. In many instances the disease was epidemic in certain localities, leading to the destruction of large numbers of the affected animals. The medical literature of the past few years is full of instances of psorospermic disease, a number of pathological conditions, particularly of the skin, being charged to these organisms.

The structure of the myxosporidia is widely different in the various species, and in the developmental stages of the same species, so that the descriptions of the various investigators differ considerably. As a rule, we find the organism described as existing in two conditions, the adult or amœboid form, and the spore form. In the adult condition the myxosporid exists in the form of a granular, protoplasmic mass, with a well-defined ectosarc and endosarc, and exhibiting sluggish amœboid movements. In this mature condition it often attains a considerable size. The spore stage, however, seems to be the condition under which the parasite is most commonly found, and here occur the variations which distinguish the species. The spores of the myxosporidia differ in size, shape, and contents. They are surrounded by a capsule measuring 8 μ to 20 μ, resistant to re-agents, and often presenting a well defined striation.

The capsule usually consists of two valves joined together at the middle of the spore, the line of union being readily visible. The shape of the capsule may be spherical, oval, cylindrical, spindle-shaped or lens-shaped. Within the capsule are found the pole corpuscles ("Pölkörperchen," "Polkapseln," "polar bodies," etc.), varying in number with different species from two to eight. These pole corpuscles are usually oval,or pear-shaped, and highly refractive; and are so named because they lie at one or both poles of the spore. We know nothing about the ultimate structure of these bodies. The pole corpuscles lie in a vacuole in the spore, and aside from them, the spore contains a plasmatic (protoplasmic (?)) mass, which may be aggregated at one pole of the capsule, the corpuscles lying at the other; or the plasmatic body may lie on one side of the oval spore, with a pole corpuscle at each pole of the long axis. Within the plasmatic substance there occurs one to four sapraninophile bodies (Bütschli), which have been regarded as nuclei by Thélohan. Aside from these structures, the spores of the myxosporidia present the peculiar projectile threads by which the group is distinguished from other sporozoa. Under ordinary conditions, the threads are not visible, being transparent and contained within the spore. Balbiani and Schneider maintain that the threads are rolled within the pole corpuscles, from which they are ejected. Upon the application of certain reagents, as hot water, caustic alkalies, iodine, or glycerine, the threads or flagellæ become visible, and may be traced from the exterior of the spore to the pole corpuscle within the capsule. The significance of these threads is not clear. They have been regarded as sperm cilia (Balbiani); as organs of fixation (Leuckart); or as weapons of offense, identical with the stinging threads of certain hydrozoa and infusoria.

The germination of the spores of myxosporidia, is not fully known. Lieberkühn and Balbiani have described a splitting of the capsule, and a wandering out of an amœboid germ (the plasmatic mass), in the psorosperm of the pike, and they call this a phenomenon of development. This interpretation requires confirmation, however. Henneguy and Thélohan have observed a process of mitosis of the plasmatic particles of a large myxosporid infesting the shrimp (*Crangnon vulgaris*); these masses eventually dividing into eight nucleated particles, each of which formed a new spore. The stages by which the spore arrives at the adult amœboid condition are not known.

* * * * *

The case of myxosporidia infection which came under the author's notice, occurred in a large female toad (*Bufo lentiginosus* Shaw), which had been kept in confinement in the laboratory for several months. The animal had been sent from the country early in the month of September, with a lot of frogs, and had been left in a tub along with a couple dozen frogs. These frogs showed no unusual mortality, and were gradually consumed in the biological class, until only the toad remained in the tub. About the middle of November I happened into the laboratory one morning, and noticed the toad lying on its back, apparently dead. Upon removing it and watching carefully, a faint flutter of the pleural wall over the heart could be detected; but no signs of breathing. Previous to this time, it had been remarked that the animal was gradually increasing in size, and on the occasion of the last examination, this feature was particularly noticeable. The animal being a large specimen of its kind, the increase in size had been unconsciously ascribed to development of ovarian ova.

Being desirous of obtaining a set of histological specimens from this species for comparative study, I hastily proceeded to open the pleuro-peritoneal cavity of the dying animal, and obtain some tissue for fixation, before death had ensued. My friend, Mr. Champlin, was present during the dissection of the toad, and also took specimens of the various organs for histological study.

Upon opening the abdomen, a large quantity of clear, straw-colored, serous fluid escaped, both from the abdominal cavity, and from the sub-cutaneous lymph sinus. The extreme size of the trunk of the animal was, in large part, due to the accumulation of this fluid. The lymph sinuses of the limbs were also distended with the fluid to an unusual degree. The ovaries were moderately developed, but not to an extent to account for the extreme size of the abdomen. As a matter of fact, the animal had suffered

from a *dropsical effusion* which had been gradually increasing to the time of death. Nothing unusual was noticed about the macroscopic appearance of the organs, save that the urinary bladder was largely distended with fluid, and that the kidneys were enlarged to about twice their normal size. The fresh tissue was fixed in Flemming's solution, and in absolute alcohol, a piece of each separate organ being dropped in each of the solutions. The tissue thus fixed was obtained from all the organs of the pleuro-peritoneal cavity, together with the tongue, brain, sciatic nerve, and a piece of the abdominal wall. Mr. Champlin was first to cut his tissue, and to observe the peculiar organisms in the kidney. He cut a piece of alcohol fixed kidney tissue, stained it in Pfitzner's safranin, and upon examination noticed the brilliant red bodies in the tubules, which he suspected to be sporozoa, since we were both anxiously looking for these organisms at that time. Upon examination of the section, I agreed with him as to the sporozoan nature of the bodies, but could not assign them to their biological position. In fact, it was only after a study of the literature upon the subject, and a study of the organisms with various reagents, undertaken at intervals during several months, that I was enabled to decide upon the nature of the parasites. By a fortunate coincidence, I hit upon the work of Lutz, through the aid of my colleague, Dr. Mitchell, and thus had the doubts as to the nature of our organisms set aside. Aside from the fact that I could get no one to identify the myxosporidia, I was more tardy in reaching a decision myself, because of the remarkable diversity of results obtained with the variety of staining reagents. Now that the character of the organism is clear, the diverse effects of reagents on the spores may be turned to valuable account, as I hope to show in part in this communication, and more fully on a subsequent occasion.

Since the discovery of Mr. Champlin, I have made a large number of sections of the kidney tissue, both from alcoholic pieces, and from those fixed in Flemming's solution, and in every section multitudes of myxosporidia were found. Although I have made sections of other organs, I have succeeded in finding the parasites only in one other situation, viz., in the urinary bladder. Hence the conclusion that we had in this case, a myxosporidia infection of the *urinary organs* of the toad. The organisms were almost invariably present in larger or smaller groups, in the lumen of the urinary tubules of the kidney, as is shown in the micro photograph, (Fig 1.). *I never found them in the substance of the epithelial cells*, nor could nuclear metamorphoses be observed in the kidney cells, such as are described with intra-cellular sporozoa ("Karyophagi").

Occasionally the organisms appeared among the blood corpuscles in a large vessel, though it is impossible to say that their presence in this situation may not have been due to some displacement during the manipulation of the object. They were never found in the glomeruli. In the urinary bladder the parasites were found sparingly present in the folds of the collapsed organ, always on the interior, and not imbedded in the bladder tissue. Aside from the myxosporidia, the kidney was found to be the seat of an extensive invasion by a variety of *bacteria*.

As to the pathogenic rôle of the myxosporidia in this case, there can scarcely be a doubt but that they were the direct factors in the production of the pathological changes leading to the death of the host. A glance at the micro-photograph, Fig. 1, will convince one of the extremely large number of these foreign bodies in the kidney tubules, since the photograph was made from a very thin section, and is only a fair representation of the findings in all of the sections examined. In fact, the tubules of both kidneys were filled with the parasites; and it is evident that the mere mechanical effect of this foreign material in the tubules must have led to an obstruction of the secretory functions of the organ, and, as a remote result, to the ascites and general œdema. Undoubtedly, the presence of large numbers of bacteria in the already overburdened kidney was potent in hastening the fatal termination; but these vegetable microörganisms must be regarded as the elements of a secondary infection. It is not difficult to conceive that the diseased kidney, with its damaged secretory function, would furnish an inviting focus for bacterial invasion; and particularly since the route from the exterior is such a direct one in those animals in which the urinary secretions empty into a cloaca. As to the origin of the myxosporidia infection, we can only conjecture that it must have occurred by way of the cloaca to the bladder, and from here the parasites ascended the urinary passages, eventually lodging in the kidneys.

* * * * *

For the purpose of studying the myxospiridia in detail, the kidney tissue was imbedded in xylol-paraffin, cut in thin sections which were fixed on the slide by the water-albumen method, and then stained with a variety of dyes. For the purposes of this study, the tissue fixed in Flemming's solution was not suitable. As intimated above, the effects produced by the variety of staining agents were remarkable in diversity, and it would far exceed the pretension of the present communication to enter into a full discussion of this most important subject. The author hopes, however, to give a more detailed description of the micro-technical studies upon these organisms in the near future, since they seem to throw some light on the perplexing question of the carcinoma parasite. For the present, a brief description of the morphology of these particular sporozoa, and a hint as to the two chromatic substances in their spores, is all that can be given. To adequately represent the varying color reactions, some very perfect chromolithographic plates are required, and these can not be prepared in the limited time at disposal.

The organisms found in the kidney and bladder of this toad I have designated myxosporidia, because of their resemblance to the organism described by Lutz in the liver and gall bladder of a Brazilian toad, and because, upon appropriate staining, I was able to demonstrate the projectile threads which characterize this group of sporozoa. In my specimens I was able to demonstrate only the *spores* of this parasite, and in none of the preparations could I discern the amœba-like myxosporid which is said to represent the mature organism. In this respect my observations agree with those of Lutz, Henneguy and Thélohan, and others. It is probable that, in this case, the parasite did not reach its adult condition in its batrachian host; but here only passed one stage of its evolution; that is, the spore stage.

The spores were surrounded by a well defined capsule of a slightly oval shape, measuring about 6 μ and 8 μ respectively in the short and long diam-

eters. The capsule appeared nearly transparent with certain stains; but in sections stained with gentian violet, after Gram's method, the capsules retained the violet color, and exhibited a well defined striation. The striæ on the capsule usually proceeded from side to side of the spore, parallel with each other; but with a somewhat indefinite, wave-like deviation (Fig. 4, *a*, *b*, *c*.). In the case of the empty fragments of capsules, which were frequently found, it was possible to see that the striation was the optical expression of spiral bands of less refractive material, winding about the spore (Fig. 4, *c*), as Thélohan has pointed out. Aside from these striæ, a well defined wider band surrounded the middle of the spore, passing from side to side. This band was particularly well seen at the edges of the capsule, where a slight prominence marked its presence as seen in profile (Fig. 4, *b*). The significance of this heavier band became clear when it was found that the capsule was *bi-valvular;* that is, a complete capsule consisted of two symmetrical halves joined together, the heavy band marking the junction of these two valves. I was never able to demonstrate a loosened band, apparently sprung from the uniting edges of the spore valves, after the manner of a loosened barrel hoop, as has been described by Lutz. Furthermore, it may be noted that, in respect to capsules, the myxosporidia here described differed from the organisms of Lutz, in that the line of union between the valves of the capsule was at right angles with the long axis of the spore; while in those of Lutz, the line of union between the valves crossed the long axis of the spore at an angle of 45°.

Within the capsule three structures were readily visible—the pole corpuscles, vacuole, and the plasmatic mass. In sections stained with alcoholic safranin (Pfitzner's), the capsule was unstained; but the pole corpuscles were strikingly prominent on account of their brilliant red color; and the plasmatic mass was stained a light pinkish hue.

The pole corpuscles were two in number, lying side by side, often in contact, at one side of the spore, a little nearer one side wall than the other. On one side of the pole corpuscles was a clear space or vacuole; while on the opposite side lay the plasmatic mass (Figs. 2 and 3). In size, the polar corpuscles measured from 3 μ to 3½ μ on an average. With safranin they stained a homogeneous red color, showing no structure. In unstained specimens these bodies were glistening and highly refractive. The situation of these polar corpuscles on the side of the spore is peculiar, and in this respect our myxosporidia differ from those thus far described. The usual situation of these structures is at one pole of the long axis of the spore, in groups of two or more. In the species described by Lutz, the pole corpuscles were situated one at each pole of the long axis of the spore; and in his specimens, the projectile threads proceeded from the pole corpuscles, parallel with the long axis; that is, one thread appeared at each pole of the long axis of the oval spore.

Occasionally, only a single polar corpuscle could be found in a spore, but this may be explained, in part at least, on the supposition that a spore had been severed by the microtome knife, leaving only a part of the capsule, and one corpuscle. In safranin preparations it was frequently possible to observe the brilliant red pole corpuscles lying outside of the spore capsules, in the tissue of the kidney. Whether these free lying corpuscles had voluntarily escaped from their capsules, or whether this appearance was due to accident in handling the section, is of course, impossible to assert positively. I am of the opinion, however, that the migration of the pole corpuscles is a natural phenomenon in these organisms, and that it possibly has as much, or more weight in the life history, than the migration of the plasmatic mass usually described. The presence of many empty capsules in the sections, would lend weight to the view of the expulsion of the contents of the spore, and in Fig. 4, *a*, I have represented a capsule with a single spore, which appeared to be in the act of escaping through a rent in the capsule.

The plasmatic mass lay within the capsule, between the pole corpuscles and the side wall of the spore. The size and shape of this structure varied considerably; sometimes the mass was so extensive as to fill all the space existing between the polar corpuscles and the adjoining side of the spore; in this condition no evidence of a division of the plasmatic mass could be discerned. In other spores, the mass was less extensive, sometimes indeed, appearing very small and shrunken. In the cases in which this substance was less in amount, a well defined segmentation was frequently noted; the line of division extending through the middle of the mass, each half of the divided mass enveloping a pole corpuscle in the form of a well defined crescent. The appearance of the plasmatic mass, and an indication of the double crescents, may be seen in Figs. 2 and 3. When examined by high powers (Leitz obj. $\frac{1}{12}$ inch), the plasmatic mass exhibited indications of a delicately granular condition, in specimens stained by the anilin dyes. Aside from this, no indication of structure could be observed in the plasmatic bodies, and such a structure as a *nucleus*, or evidence of nuclear contents, was invariably absent. I could not even demonstrate the micrococci-like particles in the plasmatic body, as have been described by Lutz; nor the safranophile particles of Bütschli. In regard to the absence of nuclear structures in these spores, my observations confirm those of Lutz.

On the side of the pole corpuscles opposite the plasmatic body, the vacuole occurred. This space was unstained in specimens in which the excess of stain had been washed out; but in over-stained spores the vacuole retained the dye, though not so strongly as the pole corpuscles and the plasmatic body.

The projectile threads were best seen in a section stained with Babes' anilin-water safranin, where they were very prominent because of their yellowish color. In many other specimens they could be outlined by careful examination, though their unstained condition made their recognition difficult. Even in the most favorable specimen, it was found that the threads could not be detected in the majority of the spores; and in those spores presenting these curious structures there was considerable difference in their length; often appearing curled or rolled at the end, as though only partly unwound. When fully projected, these threads were of surprising length, often six or eight times the length of the spore, and extending far into the surrounding tissues. The length of a fully extended pair of threads is shown in Fig. 3, which is a camera lucida tracing of the spore with its projectile threads, and illustrates strikingly

the remarkable extent of these processes. It would appear that the length of these threads is extreme; since the only other observation on this point is that of Lutz, in which he gives the length of the threads in his myxosporidia as four to five times that of the spore. Since these structures could be demonstrated in the sections of hardened tissue, by appropriate staining, it is, of course, evident that they must have been thrown out from the spores before the organisms were killed by the alcohol employed in fixing; and that the length of the threads would then depend upon the extent to which they had been projected. As has been previously stated, the generally accepted view is that the projectile threads are contained in the pole corpuscles, rolled in the form of a spiral, and that they are ejected by the living spore upon the application of certain reagents, as alkalies, glycerine, etc. Of course, in my own specimens, I was unable to verify this last statement, since the organisms were all killed before examination. In the preparation showing the threads most plainly; *i. e.*, the one stained with Babes' safranin, I could often see the indication of the thread as a well marked protuberance on the pole corpuscle, and in other spores it seemed as though the rolled thread could be dimly seen within the corpuscle. It was noted, however, that no difference in the intensity of the stain could be observed in the pole corpuscles with or without the projected threads.

The threads when visible, were always two in number, one originating at each pole corpuscle, and passing to the exterior through the side of the capsule containing the vacuole; and at right angles to the long axis of the spore. They could be readily traced within the spore and to the surface of the pole corpuscle, in the preparation stained in Babes' anilin-water safranin. Fig. 3 is made from this preparation, and shows the origin of the threads at the periphery of the pole corpuscles. In regard to the origin and direction of the projectile threads, the myxosporidia in this case differ from those ordinarily described; and from the organism of Lutz. In spores with pole corpuscles aggregated at one pole of the capsule the threads are naturally found only at this one pole, projected parallel with the long axis of the spore. In the species described by Lutz, the threads could be traced to the two corpuscles, one lying at each pole of the spore; but here the threads were again projected from the ends of the oval spore; that is, parallel with the long axis. The projection of the threads through the lateral wall of an oval spore at right angles with the long axis is, so far as the literature at my disposal permits me to judge, a unique condition, and serves still further to stamp these myxosporidia as a very distinct species.

* * * * *

In the foregoing description, it has been several times remarked that the organisms were carried through varying micro-technical processes, and that, as a result of this study, a number of interesting facts were elicited. This was particularly true with respect to the action of the different staining agents employed; but of these results, only one will be here described; viz., the effects of certain *double* stains upon the contents of the spores of these myxosporidia.

Ordinarily, the varying effect of two staining agents on the same structure, or organisms, would be of very little interest; for the operation of the so-called "double stains" in selecting certain portions of an object, has long been known to microscopists. Within the last few years, however, we have learned to attach a considerable significance to the chromophile properties of animal and vegetable tissue, particularly in the nucleus; and in directing our attention to this subject, the works of Ogata, Luckjanow, Steinhaus, Macallum, Auerbach, Watasi, and others, have been prominent. Particularly important, in this direction, is the work inaugurated by Auerbach, who has distinguished, according to their chromophile properties, two kinds of nuclear substances; viz., the blue staining or *cyanophile*, and the red staining or *erythrophile*. In this selective property, a number of staining substances are mentioned and classified by Auerbach; but it is evident that the property belongs to a much larger class of dyes than those detailed by this authority. For instance, Watasé has employed, in his studies, several new dyes, principal among which are the anilins designated cyanine, for demonstrating the cyanophilous or blue substance; and erythrosine and chromotrop, for staining the red or erythrophilous substance. Watasé has also employed the Biondi-Heidenhain triple stain, and finds it possible to develop the two chromatic substances in suitable objects, with this reagent. Noeggerath has found Russell's staining combination of fuchsin and iodine green, and Sjöbring's eosin and hematoxylin method, to be selective upon the two nuclear substances.

The significance of this chromophilous phenomenon has been most fully elaborated by Auerbach, who maintains that it demonstrates the *sexuality* of the nuclear chromatin. Auerbach has found, and many careful investigators have corroborated his discoveries, that the purely male chromatin (the head of the spermatozoon) is always cyanophilous, and that the purely female chromatin (the chromatin of the germinal vesicle, and the germinal spots of the ovum) is always erythrophilous. Luckjanow and Watasè have observed the development of these chromophilous properties in spermatogenesis, and their decline during fertilization. In the cells produced by a union of these sexual substances; or, in other words, in the segmentation nucleus, and the nuclei of the cells of the resulting organism, the two substances would be equally distributed; and such nuclei would not exhibit a marked preponderance of either cyanophile or erythophile substance.

Whether these differences in staining reactions may be carried to the extent of indicating the *sexuality* of chromatin, as Auerbach maintains, is impossible to say at present. The views of Auerbach have, naturally, not passed unchallenged, and it must remain for future research to indicate the exact significance of these facts. However, it is clear that the substance of the nucleus, and particularly the nuclei of the sex elements, exhibit marked preference to certain dyes, and this would indicate, first of all, a difference in the *micro-chemical properties of chromatin*.

Investigation along this line must be profitable in advancing our knowledge of nuclea structure. The line of research inaugurated by Auerbach has been introduced into pathology by Noeggerath, in his studies on the development of carcinoma; and he has found much variation in the proportion of the two chromophile substances in carcinoma cells; and upon this ground he tentatively advances an hypothesis to explain the origin of the disease.

In examining the sections of the infected kidney, stained with carbolic fuchsin and carbolic iodine green (Russell's method), I was surprised to find, in the spores of the myxosporidia, a difference in the staining reactions of the contained structures. It was seen, in many of the spores, that the *pole corpuscles stained a brilliant red*, while the *plasmatic mass stained a light green*. This difference in the chromophile reactions of the two structures was much more marked in certain spores, than in others. The pole corpuscles uniformly stained red; but the plasmatic mass varied in color from violet to a well defined green. It seems that this difference depended, in large part, upon the stage of development of the plasmatic mass. In cases in which the mass was large and unsegmented, and occupying a large part of the capsule, the green stain was less clearly defined; but when the plasma was more condensed, and divided into the two crescents which were closely applied to the surface of the pole corpuscles, it stained a well marked green. In interpreting this curious chromophile phenomenon in the terms proposed by Auerbach, we may say that, in the spores of the species of myxosporidia we have described, the *pole corpuscles are erythrophilous* and the *plasmatic crescents are cyanophilous*. Whether this signifies a *sexual* difference in the contents of a spore capsule, can not be positively asserted at this time. In fact, at a time in which we know comparatively so little about the life history of this class of microörganisms, it would be premature to analyze the meaning of this observation. It may be true, indeed, that the chromatic reactions described only indicate a *micro-chemical* difference in the substance of the pole corpuscles and the plasmatic mass; and that either one or the other may be the true sexual element. Viewed in any light, the fact remains that the observation is an important one, directing, as it does, our attention into a comparatively new field of study upon these perplexing organisms; and indicating, as it does, the great importance of these micro-chemical staining reactions in all lines of biological and pathological inquiry. To fully apprehend the import of this observation, the study must be extended over numerous species of myxospiridia, in varying stages of development; and both in fresh and hardened preparations. Nor must the work be confined to the myxosporidia, or even the sporozoa alone; but be extended to other unicellular organisms whose size renders them more favorable objects, and whose life history is better known. Manifestly, this line of investigation will be equally fruitful in biology and pathology; for many of the protozoa are recognized as pathogenic in a number of diseases. Particularly is this true at the present time, with regard to carcinoma, when so much weight hangs upon the positive demonstration of a sporozoan parasite. The relation of the views of Auerbach to carcinoma development has been already indicated by Noeggerath in a certain direction, and lately Adamkiewicz has carried the observations of Noeggerath to still another interpretation; viz., that of the possibility of an existence of the two separate chromophile substances in unicellular parasites.

Several staining combinations were tried on the spores of these myxosporidia, in an endeavor to further demonstrate the chromophile substances. The Biondi-Heidenhain triple stain, and Watasé's combination of cyanine and chromotrop,[1] failed to stain the spores in a characteristic manner; that is, the structures of the spore were not differentiated by the dyes. I do not consider this fact as indicating a non-selective tendency of the pole corpuscle and plasmatic mass for the dyes; but that it is rather due to a failure of the stain to penetrate the capsule. In sections first stained with Pfitzner's alcoholic safranin, and then stained with aqueous methyl blue, rapidly washed with alcohol, and cleared in xylol, the differentiation of the cyanophilous plasmatic mass and the erythrophilous pole corpuscles was most striking. This success of fuchsin and iodine green on the one hand, and safranin and methyl blue on the other, in exerting their selective properties, seems to be due solely to their more powerful staining properties, which permits them to penetrate he somewhat resistant capsule.

The observations herein presented are as follows:

1. An infection of the urinary bladder and kidneys of a toad (*Bufo lentiginosus*, Shaw), with the spores of a peculiar species of myxosporidia.

2. The parasites were doubtless the direct factor in bringing the animal to its dying condition; mechanically blocking the kidney tubules; interfering with the secretory function of these organs; thus favoring the existing general œdema; and preparing the way for the secondary infection by various bacteria.

3. The organisms differed from those usually described. 1st. With regard to the line of union between the valves of the spore; which divided the capsule in two symmetrical halves, and which intersected the long axis of the spore at right angles. 2nd. With regard to the pole corpuscles; which were situated near one side of the spore. 3rd. With regard to the projectile threads; their extreme length; and their penetration through the side wall of the capsule, at right angles to the long axis.

4. The pole corpuscles and the plasmatic crescents exhibited different chromophile properties. The pole corpuscles were strongly erythrophilous; the plasmatic crescents were cyanophilous. This erythrophilous property of the pole corpuscles was more constant than the marked cyanophilous property of the plasmatic mass; which seemed to vary somewhat in different stages of development.

EXPLANATION OF PLATE.

FIG. 1. From a micro-photograph of a section of kidney stained with fuchsin and iodine green, made with Leitz obj. No. 3, ocular 4, showing at *a*, and in many other parts of the photograph, the masses of myxosporidia in the kidney tubules; at *c*, a large blood vessel filled with blood corpuscles; and at *b*, blood corpuscles, from extravasation, lining the edge of the section.

FIG. 2. A single spore showing the projectile threads with their origin on the periphery of the pole corpuscles, and their passage through the wall of the spore at right angles to its long axis. The figure is made from a camera-lucida tracing, and represents accurately the extreme length of the threads which could be traced through the kidney elements in the section. From a section stained with Babes' anilin-water safranin.

FIG. 3. A camera-lucida drawing representing a kidney tubule with three spores lying in its interior. From a specimen stained in Pfitzner's alcoholic safranin, showing the faint capsule, the brilliant red polar corpuscles, and the plasmatic mass at one side of the spore. A close inspection will disclose the difference in the shape of the plasmatic mass. In one spore it is undivided; in another a line of division is faintly visible; while in the third, two well defined crescents may be seen lying on the pole corpuscles.

[1] I am under obligation to Dr. Watasé for samples of these anilins and directions for their use.

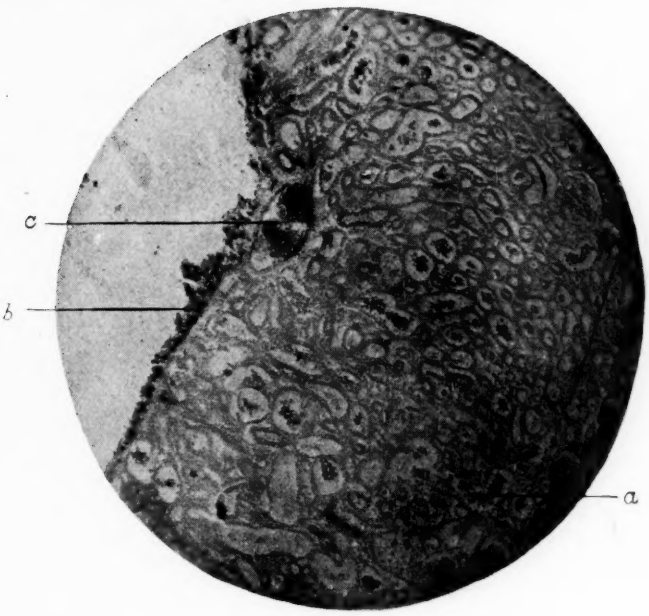

Fig. 1.

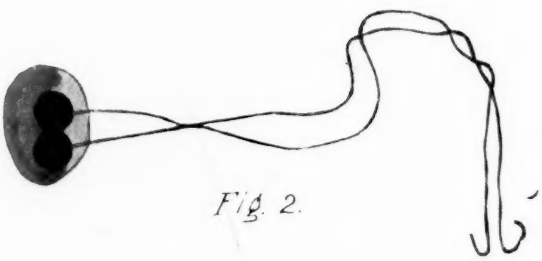

Fig. 2.

Fig. 4.

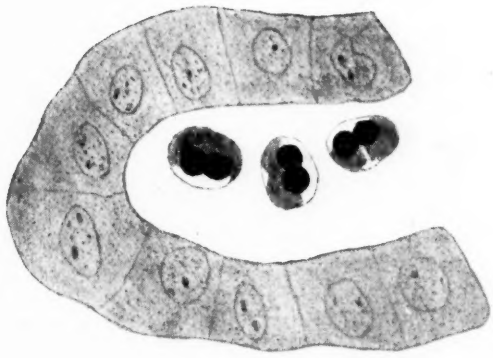

Fig. 3.

A P Ohlmacher

TO ACCOMPANY DR. OHLMACHER'S ARTICLE, MYXOSPORIDIA IN THE COMMON TOAD.

FIG. 4. Capsules of the spores showing the striations. In *a*, the markings will be seen to be running nearly meridianally; and at one side of the spore a single pole corpuscle appears in the act of escaping from a rent in the capsule; at *b*, the markings are more nearly equatorial, and in the center of the capsule may be seen the heavier line marking the line of union between the two valves. The fragment of a capsule at *c* shows the striations to be apparently the optical appearance produced by bands of a more dense material encircling the capsule.

FIG. 3 was drawn with Leitz' "Pantachromatic" obj. 3 m. m., oc. 4. Figs. 2 and 4 were made with Leitz' "Pantachromatic" obj. 2 m.m., oil immersion, oc. 4.

REFERENCES.

The following list comprises only those works referred to in the foregoing. A more complete bibliography of the sporozoa will be found in the papers of Kruse and of Braun:

Adamkiewicz: Untersuchung über den Krebs und das Princip seiner Behandlung. Wein and Leipzig, 1893.

Auerbach: Ueber einen sexuellen Gegensatz in der chromophile der Keimsubstanzen. Sitzungsberichte der königl. Preuss. akad. der Wissen. zu Berlin, 25 juni. p. 713–750, 1891.

Balbiani: Compte rendus, t. lvii, p. 157, 1863.

Braun: Cent. f. Bak u. Parasiten, Band xiii, No. 3, p. 96–101, 1893.

Garbini: Rendic. della R. Accad. dei Lincei. Vol. ii, Feb., 1891.

Henneguy and Thélohan: Compt. rend. Ac. Paris, T. cxiv, p. 1552–1555, 1892.

Korotneff: Zeitsche f. Wies. Zool., Bd. liii, p. 591–596, 1891 and 1892.

Kruse: Hygien. Rundschau, p. 357–380, 453–485, 1892.

Leuckart: The Parasites of Man, English Translation, Edinburgh and Philadelphia, 1886.

Lieberkühn: Müller's Archiv. f. Anat. u. Physiol. p. 1–24, 349–368, 1854.

Lindner: Deutsche Med. Zeitung, p. 349–353, 361–363, 371–374, 1892.

Lutz: Cent. f. Bak. u. Parasiten. Band v, No. 3, p. 84–88, 1889.

Mingazzini: Atti R. Accad. Lincei Rendiconti. Sec. iv, vol. vii, Fasc. 4, p. 136–141.

Mitchell: The Scalpel, vol. i, No. 2, p. 19–24, 1892.

Noeggerath: Berträge zur Struktur und Entwikelung des Carcinoms. Weisbaden. 1892.

Pfeiffer, L.: Die Protozoen als Krankheitseweger. 2 Aufl. Jena. 1891.

Schneider: Archiv. d. Zool. expér., t. iv, p. 548, 1875.

Thélohan: Comp. rend. soc. biol. Paris, 30 janvier, 1892.

Watasé: Jour. morphology. vi, No. 3, p. 481–493, 1892.

Wright: Canad. Pract. vol. xv, No. 2, p. 30–36, 1890.

DOMESTIC CORRESPONDENCE.

Revision of the Code.

TO THE EDITOR OF THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

Dear Sir:—Literally, re-vision means seeing again, and that is certainly what is now needed with reference to the Code of Ethics, not only the seeing again the immediate ideas expressed and the language used to express them, but clearer perception and better application of the underlying principles. The essential thing is to secure clearer thinking, and more conscientious observance of correct ethical principles. Codes are but a means towards the attainment of this end and probably they are not the most valuable or important means. A diffused, misunderstood, unenforced code may, as shown in my previous letter, instead of being a help in this direction, be a serious hindrance.

There is no doubt that the code has in many instances exerted beneficial influence, particularly on the thought of those just entering the profession. Placed in the hand of the young graduate, it has often and might have been much more frequently as influential and as valuable as any other essay that he could have read, either upon this or upon any other topic of professional interest. But would it not be of more value to this part of the profession, instead of pushing aside the subject of professional ethics into an enacted Code (which purports to be a workable law, but in reality is not) —would it not be more beneficial to recognize the importance of professional ethics by a series of lectures to those preparing to enter the profession? The rapidly developing subject of professional ethics demands for its elucidation a living literature, instead of a dead Code.

The Code was intended to indicate in a way who do and who do not belong to the medical profession. This function was doubtless best performed and most important at the time of its adoption. Since then there have been radical changes in the condition of the medical profession. In direct opposition to what was then the case, almost every State now has laws determining who are and who are not legally, and in the general judgment of the community, entitled to practice; and such laws, though often very defective, are rapidly being improved and applied to new sections of the country. In the future, these laws are certain to determine the boundaries of the medical profession upon lines of preparatory education and professional training. Lines which will necessarily be important, because accepted by public opinion, and by the large proportion of the profession outside of the Association aud its affiliated Societies. The need of a Code of Ethics to define the boundaries of the medical profession has largely passed away, and its influence from this time forward will be rather in establishing the lines, not of a profession, but of a sect.

Again, the American Medical Association, as a whole, can not determine whether any particular man belongs properly within the profession or not. Even with our Code of Ethics, this really rests with the local societies, nor can any code of ethics be drawn that will work, except in so far as it is supported by local professional sentiment. The professional standard in different places varies; in some it may be lower than in others, but the best we can do about it is that when his immediate neighbors accept a doctor as their peer in the profession those of us living at a distance must go on the assumption that their judgment in the case is correct. It is at least the best judgment that can be obtained.

It would, therefore, be better if the local societies were made to feel more strongly their responsibility in the matter, and, in many localities the closer adaptation of the code of ethics to the state of local professional opinion would result in a marked raising of the standard of conduct.

Perhaps the best possible solution of the present problem of revision would be the adoption by the American Medical Association of a code of ethics declaring, in general terms and the fewest possible words, the fundamental principles of professional ethics; and the adoption in the by-laws of a provision requiring that the codes of ethics of affiiliated societies shall be *in accordance, not identical* with the code of this Association.

Such a course compelling local medical societies to fully consider the principles of professional ethics, and the methods by which they may be enforced, instead of laying the whole subject aside by simply calling for the ayes and nays would secure a true revision of the Code. And every local code which came into existence would have the enormous advantage of being better adapted to the views of the profession in the locality in which it was to be enforced.

That there would be great diversity on many subjects, and that the judicial tribunal of our Association would have opportunity and need to exert its discretion and influence, there can be no question. But as long as diversity of view actually exists in the minds of the profession, the Association can only become truly a representative body by recognizing it and providing for it, and, if the American Medical Association is to become that which its founders dreamed and which we all desire, the time to recognize and provide for such diversity of professional opinion has come. Let us have professional union in all matters in which we are ready to unite; and still let us utilize what benefit diversity of view can bring.

EDWARD JACKSON.

215 South 17th Street, Philadelphia, Pa.

TO the Editor of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.

Sir:—The discussion of the Code is assuming much importance in THE JOURNAL, but not too much considering the issues involved. I have followed it with great interest as the different writers very distinctly indicate the cleavages of professional opinion on great ethical subjects. They vary

from a keen appreciation of, and devotion to the great moral truths and principles which underlie nobility of character in any profession or business, as set forth in the classical letters of "Conservative Member," to the utter lack of all pretension to professional honesty as exhibited in the letters of "Fair Play," and "Practitioner." This discussion has not only convinced me that the Code as it stands should be firmly maintained by the Association, but that the schools should be compelled to teach it thoroughly to every graduate. It seems impossible that some of your correspondents could have read the Code, much less have studied it in detail. If they have not they could not spend an hour more profitably than in reading it. Another fact made apparent by this discussion is this, viz., without the restraining and sustaining influence of the Code, many medical men in all parts of the country would gravitate rapidly to the lowest level of quackery, and bring contempt upon the profession. In the interest of those members of the Association whose feeble knees scarcely sustain them in an erect position let the Code remain. INQUIRER.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

Dear Sir:—For months past we have watched with curious interest what has been published in THE JOURNAL, in reference to the revision of the Code of Ethics. And while we have concurred with much that several critics have published in reference thereto, none we believe, have so nearly expressed our sentiments as Drs. A. C. Simonton, in April 22, and Thos. F. Rumbold, in May 6. So to these we refer, for much that we would otherwise say on this subject. But we beg a little space to add a few random jottings.

It has been our humble lot to associate, more or less intimately, with doctors of high and low degree in various parts of our country—north, east, south and west; and with extremely rare exceptions, we have observed that those sticklers for a *written Code of Ethics*, are just the class of persons who most frequently violate those golden rules of conduct, the basic principles of which are the birthright of every truly honorable person. Who has not often seen the *written* Code of Ethics used as a cloak and defense for most contemptible wrong doing of doctors? But we have never observed an instance in which a would-be crooked doctor was compelled or influenced in any appreciable degree to "tote fair," by the use of the written Code of Ethics. Hence, we have long since ceased to respect said Code as a ruling power.

Now, we are told that "some of the largest societies that are in affiliation with the American Medical Association and annually send to that body their quota of delegates, do not in their constitutions or elsewhere make any recognition whatever of the Code of Ethics, or require their members to subscribe to an acceptance of the Code."

Now this is quite astonishing, at least to us unsophisticated denizens of this way-off "neck of the woods," down in wild rebellious Texas.

Just think of it! Right in the classic precincts of the brilliant hub of the great Northwest, yea, even under the vigilant nose of great Father Davis (whom we all delight to honor) can such things be? Well may we meditatingly soliloquize: "If the righteous scarcely be saved, where shall the ungodly and the sinner appear?"

For, indeed, may the true devotee of Esculapius turn loathingly away from this whole matter in unfeigned disgust, wondering who made Lord Percival, the Great, to rule over us, the driveling puppets of a sycophantic age.

So, like the man who bade the sun stand still until he could finish his job, we would consolingly say: "But as for me and my house we will serve the Lord," of the Golden Rule as best we may; whilst scarlet-robed Pharisees "strain at gnats and swallow camels;" and precedent-worshiping Scribes shout from the housetops, "*Oh, brethren,* THUS IT IS WRITTEN!" I. C. SMITH, M.D.

Austin, Texas, May 9, 1893.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

Dear Sir:—There is so much being said now-a-days relating to the Code of Ethics, with its disadvantages and its necessities that I deem it in accord to express my views. I am a believer in a code that will better the condition of the profession at large. To hold us together in a united brotherhood in such a way that union of thought may become a mighty force in the advancement of our science. The progress of the profession will not be so fast without a code as with one. The science of medicine will not reach its excellence by a few as it will by a united effort brought to bear on nature's resources, acting as a constant stimulus to our energies.

As the profession is becoming overcrowded there seems to be a growing discontent, in the struggle for an existence, for the present Code. It seems that it is not liberal enough in its by-laws to permit a great many who seemingly appear to honor the Code, to enter into by and forbidden paths as they would like. To proclaim to the world what manner of men they are. Not long ago while attending the organizing of a medical society, on the discussion of by-laws there seemed to be a faltering opinion among some of the gentlemen present whether to accept the Code of Ethics of the American Medical Association, or to reject it. One gray-headed gentleman arose (one who had borne the reputation of being honorable) and said that the Code of Ethics had become obsolete. But the gentleman's convictions did not convince the majority of the society, and the Code of Ethics of the American Medical Association was adopted.

We can't fairly say that because one advertises in pamphlet, circular, or that popular medium, the newspaper, he is a quack, for some of our very best surgeons use these means as a messenger to carry the news to the world, and proclaim what manner of men they are. But one that uses these means for heralding his superior skill must not forget that he is taking unfair means of gaining a reputation, providing he has taken an oath which most of us have: declaring to sustain the Code in all its forms.

But, nevertheless, whatever the condition should be, it is pretty safe in saying that one-half of all the members of the American Medical Association break some part of the Code; the bent of the times seems to be opposed to restraint. The anxiety for one to gain notoriety through printer's ink seems to be fast gaining ground. If every one that breaks some part of the Code was brought to an account, I am afraid there would not be enough left to fill the offices in our medical societies.

The times demand a change in the Code. Amendments must be made. Why! not one layman in a thousand knows or cares anything about the Code. If the times don't fit the Code, the Code must be made to fit the times. It seems reasonable to suppose that one who makes a specialty of a certain branch, ought by some means to let the people know (say by card) that he only treats certain diseases; and it might be better for the patient and for the physician if there were more specialists, and one should confine his practice to his specialty.

If medical societies were more strict in bringing to an account members who violate the Code, the present Code would do very well. But how often is it done? We might say, never. It is so infrequent. Honorable men need no code, and I doubt if any code can make an honorable man out of a dishonorable one. L. P. WALBRIDGE.

Decatur, Ill., May 9, 1893.

THE
Journal of the American Medical Association
PUBLISHED WEEKLY.

SUBSCRIPTION PRICE, INCLUDING POSTAGE:
PER ANNUM, IN ADVANCE $5.00
SINGLE COPIES. . . . . 10 CENTS.

Subscriptions may begin at any time and be sent to
THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION,
No. 68 WABASH AVE., CHICAGO, ILLINOIS.

All members of the Association should send their Annual Dues to the Treasurer, RICHARD J. DUNGLISON, M.D., Lock Box 1274, Philadelphia, Pa.

MEMBERSHIP IN THE AMERICAN MEDICAL ASSOCIATION.

This is obtainable, at any time, by a member of any State or local Medical Society which is entitled to send delegates to the Association. All that is necessary is for the applicant to write to the Treasurer of the Association, Dr. Richard J. Dunglison, Lock Box 1274, Philadelphia, Pa., sending him a certificate or statement that he is in good standing in his own Society, signed by the President and Secretary of said Society, with five dollars for annual dues and subscription for THE JOURNAL. Attendance as a delegate at an annual meeting of the Association is not necessary to obtain membership. On receipt of the above amount the weekly JOURNAL of the Association will be forwarded regularly.

SATURDAY, MAY 20, 1893.

THE TREATMENT OF ASIATIC CHOLERA.

While we are anxiously awaiting the perfection of positive, preventive inoculations against Asiatic cholera which the experiments and demonstrations of HAFFKINE appear to show is not an impossibility, and until the serum therapy of KLEMPERER and many others is rendered readily available, epidemic cholera must be subjected to rational treatment based upon our knowledge of the disease. The recent cholera epidemic was productive of considerable literature concerning the various modes of treatment practiced. Thus the importation of Asiatic cholera to New York from Europe and the confinement of a considerable number of cases at the quarantine station on Swinburne Island, gave the physicians connected with the port of New York opportunity to study certain modes of treatment, and DR. FRANK ABBOTT, JR., describes in the *Medical Record* for March 25, 1893, the general plan pursued at the quarantine station. It will be seen that the plan of treatment embodies in the main the recommendations of CANTANI, who, recognizing that cholera was a localized infective process, elaborated a method of therapeutics directed towards destroying the bacilli in the intestines and towards neutralizing the effects of the poisonous substances produced by the bacilli and absorbed from the digestive tract. By means of flooding the intestines with acid solutions it was thought that the first indication could be met quite fully. Such rectal injections have been shown to reach not only the different parts of the large intestine but also the small, even up to the stomach. In case the injection refuses to pass into the small intestine, massage over the cæcum will soon overcome the obstruction. The solution used most frequently is a 2 per cent. solution of tannic acid in sterilized water at a temperature of from 40° to 42° C. The injection is made by means of a flexible catheter about two feet in length, and a fountain syringe held at a height of four or five feet. In the adult the dose is a quart up to a gallon, repeated as frequently as the symptoms demand it; in children about a pint should be injected every two hours or more frequently if necessary. Enteroclysis performed in this way acts as a disinfectant, and the temperature of the solution may help to overcome the tendency to collapse. In many cases it was found that this treatment, in conjunction with stimulation by means of hot coffee or tea with brandy and external heat, was sufficient to arrest the progress of the disease.

When the diarrhœa is profuse and persistent and threatening collapse appears, then hypodermic injections of alkaline solutions must be resorted to without a moment's delay. The alkaline solution consists of seven parts of chloride of sodium dissolved in 1,000 parts of sterilized water, and to this may be added, if thought necessary, ten parts of brandy or six parts of pure alcohol. The temperature of the solution should be 37° C. Hypodermoclysis is performed by means of an ordinary bulb or fountain syringe and a small aspirating needle inserted into the lateral chest region. The amount injected each time is variable; in an adult a quart is not too much, and this may be repeated as often as necessary to maintain the pulse full and strong. In many cases the absorption rate of the fluid was found to have prognostic value; if absorption be slow or do not occur at all, then the vitality of the patient may be regarded as very low. Hypodermoclysis seems to replace the water lost from the blood, to increase the volume of this fluid, to dilute the ptomaines produced by the bacilli. Enteroclysis and hypodermoclysis are to be continued incessantly until the temperature of the body and the action of the heart show that the case is improving. In addition to these measures hot air baths and oxygen inhalations are of great benefit. During the reactionary stage and during the long and tedious convalescence great prudence must be exercised in diet and drink, lest serious complications arise.

The results of this method of treatment obtained at the New York quarantine station were quite satisfactory. In the steamers that brought the cholera patients over the ocean the death rate on board often reached as high as 90 per cent. of the total number of sick, while at Swinburne Island only 20 per cent. died. It is thought that the treatment, commenced early in the disease and continued with careful attention to the minutest detail, might reduce the mortality rate still lower. It will be seen that in its principles this method of treatment of Asiatic cholera is based upon a rational interpretation of the pathology of the disease as it is understood to-day, and consequently the scientific physician would expect better results than with the older plans of treatment, and the statistics appear to warrant the correctness of this view.

THE BRITISH GYNECOLOGICAL SOCIETY REFUSES ADMISSION TO WOMEN.

The English gynecologist is charged with being an ungrateful, if not ungracious, element of his profession. He does not welcome the company of his co-practitioners of the gentler sex, when he knows full well that without the gentle sex he would be but a stranded bark. Or, as the *Press and Circular* puts it, "they would retain the ladies as subjects, handmaids, patients, but display a marked reluctance to admitting them 'on all fours' within the sacred precincts of the societies."

The British Medical Association has so far and frankly retracted its former exclusive policy against medical women that some of the latter have felt that the time had come for them to try and land with both feet within the pale of the British Gynecological Society. Some of them have been rapping loudly at the door of that society, emboldened so to do by their knowledge that that society is a come-outer and a standing protest against traditional prejudices and notions. The ladies seem to have forgotten the fact "that protestation in professional matters is more often personal" than based on principle and may be a very one-sided and self-interested affair. These ladies have made two applications for membership; they encountered a gruff negative the first time they knocked at the door. When the second application was made "though a noise as of a struggle inside was heard there was a voice gruffer than ever, that bade them gird up their loins and begone. It would be foolish to suppose that the ladies will take 'no' for an answer. They have not done so in the past, and they are unlikely to do so in the future." The doors must sooner or later open, and there must be a smile of welcome, too, on the face of him who conducts them to their chairs.

PHENOCOLL HYDROCHLORIDE AS A LOCAL APPLICATION.

A paper by DR. CARL BECK, in the *New York Medical Journal*, April 22, presents an argument in favor of the antiseptic external use of the drug named in the caption. He finds in this drug a good substitute for iodoform, probably as powerful as the latter, and rather more so than aristol, dermatol, iodol, pyoktannin and some others that have been coming to us from Germany during the past year. Apart from the question of strength, the author prefers phenocoll to iodoform for the following reasons: the former is devoid of odor; it is readily soluble in hot water; it does not irritate the sound skin; it is not contra-indicated in cases of kidney disease; it can be safely applied over extensive surfaces as of burns or ulcers; it is potent in comparatively low percentages of strength. When DR. BECK began the external use of this substance, he dusted the undiluted powder over the wounded surfaces and then applied a layer of sterilized moss or gauze. Although this treatment was followed by no irritation of the integument and by no symptoms of toxic impression, he found that he obtained equally good results, in many cases from a ten per cent. gauze; so that latterly he has limited himself to the use of the penocollated gauze. This can be used on recent wounds and on granulating surfaces; the layer of gauze should be thin and as a rule be protected by a piece of sterilized moss. The dressings may be renewed once in three days for there is not an excessive discharge from surfaces thus managed. The process of healing does not vary much from that observed under iodoform. The urine was frequently examined in the case of each one of this series of cases, numbering over one hundred, with negative results as to the discovery of any renal disturbance referable to the drug. In fact, albuminous urine has not very frequently been caused by its internal administration as an antipyretic or antirheumatic, which has heretofore been the best known uses of phenocoll hydrochloride.

The report of DR. BECK covers the experience of three months at St. Mark's Hospital and the German Poliklinik of New York, and is the first installment of researches that are still being carried out with regard to the antiseptic powers of the drug named, as well as others of the synthetic series.

SYMPHYSIOTOMY SUCCESSFULLY PERFORMED UNDER DIFFICULTIES.—According to the *New York Medical Journal*, April 1, a pubic symphysiotomy was performed March 24, by Dr. J. C. Edgar, on short notice at midnight, in a tenement house. The patient was a primapara with flattened pelvis, and had been in labor forty-eight hours. The family clamored for the sacrifice of the child's life to save the mother's, but Dr. Edgar was enabled to carry out the above named operation. The child was delivered alive, and both mother and child have since been reported as doing as well as could be expected.

ASSOCIATION NEWS.

SECTION OF LARYNGOLOGY AND OTOLOGY.—There will be a Section dinner on the second day of the meeting at 6 P. M., and it is hoped that all members who attend the Section will participate. Those wishing to do so will please signify their intention without delay to the Secretary, Dr. J. E. Boylan, 113 Broadway, Cincinnati. Tickets will be furnished on the first day of the meeting.

I HAVE just received from the Western Passenger Association the usual concession of a fare and a third to Milwaukee on the certificate plan. The

passenger pays full fare going, takes a receipt or certificate at the time of the agent, which, signed by me at Milwaukee, enables the purchase of return for one-third fare. No stop over allowed on return. Where a through ticket can not be obtained at starting point, a certificate must be taken at each place of purchase of portion of ticket, and each of these must be signed to obtain reduction on return. Certificates will not be honored for return unless presented within two days after the date of adjournment (Sunday not being included as a day), nor will certificates be honored where going tickets were purchased more than three days prior to the commencement of the meeting, nor after date of closing.

I shall send this to all points, though some roads have not yet signified their agreement. All have told me they waited to learn what the Western Passenger Association would agree to and would be guided by that.

WM. B. ATKINSON.

Philadelphia, May 8, 1893.

THE COMMITTEE OF ARRANGEMENTS for the forty-fourth annual meeting of the American Medical Association, to be held in Milwaukee June 6, 7, 8, 9, 1893, desire to make the following announcement:

The Western States Passenger Association has made arrangements for the usual reduction of fares to and from the place of meeting—namely, one and one-third rates for the round trip.

By purchasing tickets to Milwaukee, and asking at the time a certificate from the railroad agent, and having that signed by the permanent secretary, Dr. W. B. Atkinson at Milwaukee, return tickets at the reduced fare can be obtained. This arrangement will not, however, admit of any stop-over, and for those who may desire to visit the Columbian Exposition at Chicago, the Committee would recommend that delegates and members purchase their tickets to Chicago and return at Exposition rate, which undoubtedly will be as low, if not lower than the one and one-third rates, and will be good for the season.

Delegates and members should then procure in Chicago round trip tickets, good for the season, between Chicago and Milwaukee, which can be purchased at reduced rates, the tickets now being $4.00 for the round trip, either by rail or steamboat.

The distance is eighty-five miles. Trains run every hour or two, either by the Chicago, Milwaukee & St. Paul or by the Chicago and Northwestern line. Boats leave Chicago at night and in the morning, arriving at Milwaukee in the morning and afternoon, and return at the same time.

On arrival in Milwaukee, delegates and members are requested to register at once at the registration headquarters in the Hotel Pfister building, corner Wisconsin and Jefferson Streets. All are also requested to register ladies accompanying them on a separate register for the use of the Ladies' Reception and Entertainment Committee. The registration office will be open from 9 A. M. to 8 P. M. Monday, Tuesday, Wednesday and Thursday and from 9 A. M. to 1 P. M. Friday.

Telegrams will be forwarded by messengers to the stopping place in the city of the delegates and members if addressed, "Care Headquarters A. M. A., Hotel Pfister." Letters must be called for at the headquarters' postoffice.

As the city will be full of visitors at the time it is advised that all intending to attend the meeting should secure hotel or other accommodations in advance, for all will be required to register their place of abode in the city.

For any further information address the Chairman of the Committee of Arrangements, who will see that prompt attention is given to all communications.

U. O. B. WINGATE, M.D.
Chairman Committee of Arrangements.

IN the Section on Dental and Oral Surgery of the American Medical Association the following papers will be read:

Address, Dr. A. E. Baldwin.
Medication in Dental Practice, Dr. Edgar Palmer.
Caries and Necrosis, Dr. G. H. McCausey.
The Enemies of the Human Teeth, Dr. A. M. Benson.
Infection of the Mouth, Dr. E. L. Clifford.
Empyæma of the Maxillary Sinus, Dr. M. H. Fletcher.
Diseases of the Jaws, Dr. V. A. Latham.
Practical Therapeutics, Dr. George V. Brown.
Subject not given, Dr. Taft.
Fallacy of Foy's Theory of the Vault, Jaws, and Gums, being influenced by Temperament, Dr. E. T. Talbot.

PRELIMINARY PROGRAM OF THE SECTION ON OBSTETRICS AND DISEASES OF WOMEN.

TUESDAY, JUNE 6—AFTERNOON SESSION, 3 P. M.

Address of the Chairman, John Milton Duff, Pittsburg, Pa. Subject: Some General References to Obstetrical and Gynecological Advancement.

1. The Causes of Diseases of Women, Chas. P. Noble, Philadelphia, Pa.
2. Menorrhagia, John Herbert Claiborne, Petersburg, Va.
3. Puerperal Hemorrhage, Jas. P. Kerr, Pittsburg, Pa.
4. Abortion, Thos. H. Hawkins, Denver, Colorado.
5. Relief from Pain in Labor, I. N. Love, St. Louis, Mo.
6. The Routine Practice of Administering Ergot after the Third Stage of Labor, T. Ridgeway Barker, Philadelphia, Pa.

WEDNESDAY, JUNE 7—MORNING SESSION, 9 P.M.

7. Thos. Opie, Baltimore, Md. Title not given.
8. Suspensio Uteri, Howard Kelly, Baltimore, Md.
9. Surgical Treatment of Uterine Flexions, M. B. Ward, Topeka, Kan.
10. Pubeotomy, Barton Cooke Hirst, Philadelphia, Pa.
11. Porro vs. Cæsarian Section, J. H. Carston, Detroit, Mich.
12. Vesico Vaginal Fistula, Its Etiology and Treatment, Augustus P. Clarke Cambridge, Mass.

WEDNESDAY, JUNE 7—AFTERNOON SESSION, 2:30 P. M.

13. Methods of Operating and Materials in Pelvic Surgery, Joseph Price, Philadelphia, Pa.
14. Methods of Removing the Uterus for Uterine Fibroids, with Report of Cases, J. N. Martin, Ann Arbor, Mich.
15. The Propriety of Operative Interference in Pelvic Peritonitis, Louis Schooler, Des Moines, Iowa.
16. Essentials of Success in Vaginal Hysterectomy, Henry T. Byford, Chicago, Ill.

17. Irrigation and Drainage in Abdominal and Pelvic Surgery, W. E. Ashton, Philadelphia, Pa.
18. A few Aseptic Precautions Necessary to Prevent Sepsis in Coeliotomy, W. H. Watham, Louisville, Ky.
19. Pelvic Conditions Supervening upon Laparotomy, Ely Van DeWarker, Syracuse, N. Y.

THURSDAY, JUNE 8—MORNING SESSION, 9 A.M.

20. The Accouchement Force in Certain Obstetrical Complications, Lewellyn Elliott, Washington, D. C.
21. The Rigid Os as a Complication in Labor, E. H. King, Muscatine, Iowa.
22. W. J. Asdale, Pittsburg, Pa. Title not given.
23. The Use and Abuse of the Uterine Dilator and Curette, Jos. Tabor Johnston, Washington, D. C.
24. Drainage of the Uterine Cavity, A. J. Puls, Milwaukee, Wis.
25. Cocaine, its Uses in Gynecology, W. H. Humiston, Cleveland.

THURSDAY, JUNE 8—AFTERNOON SESSION, 2:30 P.M.

26. Scientific Obstetrics in Private Practice, E. P. Davis, Philadelphia, Pa.
27. The Diagnosis and Treatment of Placenta Prævia, Geo. D. McElway, Philadelphia, Pa.
28. Extra Uterine Pregnancy, A. H. Cordier, Kansas City, Missouri.
29. Abdominal Hysterectomy Without a Pedicle, Rufus B. Hall, Cincinnati, Ohio.
30. Nephrectomy for Uretero Vaginal Fistula Following Hysterectomy, L. H. Dunning, Indianapolis, Ind.
31. Electrolysis in Gynecology, G. Betton Massey, Philadelphia, Pa.

FRIDAY, JUNE 9—MORNING SESSION, 9 A.M.

32. Some Points in Gynecology of Interest to the General Practitioner, Jos. Eastman, Indianapolis, Ind.
33. Salpingo Oophorectomy for Hystero-Epilepsy and Allied Neuroses, W. P. Manton, Detroit, Mich.
34. Lactational Insanity, Geo H. Rohé, Catonsville, Md.
35. The Topical Application of Drugs, versus Mechanical Treatment in Diseases of the Uterus, E. A. Wood, Pittsburg, Pa.
36. The Treatment of Certain Results of Bad Surgery in Emmett's Operation of Trachelorraphy, E. C. Dudley, Chicago, Ill.

FRIDAY, JUNE 9—AFTERNOON SESSION, 2:30 P.M.

37. Johnston's Modification of the Hodge Forceps, George C. Mosher, Kansas City, Mo.
38. The Nature of Shock, Eugene Boise, Grand Rapids, Mich.
39. A New Operation for Uterine Fibroids with Report of Cases, Franklin N. Martin, Chicago.
40. Eight Consecutive Cases of Abdominal Section, A. C. Wilson, Chicago, Ill.

Complimentary Papers by Drs. Hoffman, E. E. Montgomery, Philadelphia, Pa.; W. W. Jaggard, Henry Parker Newman, Chicago; Chas. A. L. Reed, E. Ricketts, Cincinnati, Ohio; Maxwell, Keokuk, Ia.; W. W. Potter, Buffalo, N. Y.; Chas. N. Smith, Toledo, O.; H. O. Marcy, Boston, Mass.; F. W. Ross Toronto, Can.; T. L. McMurty, Louisville Ky.; Miller, Syracuse, N. Y.; Adams, Kansas City, Mo.; Myers, Ft. Wayne, Ind.; Holmes, Rome, Ga.; J. M. Batton, W. D. Kearns, Pittsburg, Pa.; W. J. Konklin, Dayton, Ohio.

MISCELLANY.

AT a meeting of the Board of Pathologists of the New York City Asylum for the Insane held April 4, 1893, the following resolution was adopted:

WHEREAS, Death has deprived this Board of one of its most valued members, and each personally of an esteemed and worthy professional brother, Dr. Frank H. Ingram; therefore be it

Resolved, That the members of this Board express their regret at the untimely termination of his promising career, and that they extend to his family the expression of their deep sympathy with them in this great affliction.

FRED K. PETERSON, M.D. } *Committee.*
JNO. P. MCGOWAN, M.D. }

THE eighth annual meeting of the Association of American Physicians, will be held in the Army Medical Museum and Library Building, corner Seventh and B Streets, Washington, D. C., May 30th and 31st and June 1st, 1893.

THE PAN-AMERICAN MEDICAL CONGRESS.—The Section in Marine Hygiene and Quarantine has been organized as follows: Honorary presidents: Dr. Lino Alarco, Lima, Peru; Dr. Henry B. Baker, Lansing, Mich.; Dr. Cardenas, Managua, Nicaragua; Dr. J. J. Cornilliac, St Pierre, Martinique, F. W. I.; Dr. Felix Formento, New Orleans; Dr. H. B. Horlbeck, Charleston; Lieutenant-Colonel Amalio Lorenz, Subinspector of second class Spanish Navy, Havana; Dr. F. Montizambert, Quebec, Canada; Dr. Francisco Nunez, St. Tecla, Salvador; Dr. Juan Ortego, Guatemala, Guatemala; Dr. Joseph Y. Porter, Jacksonville, Fla.; Dr. John Pringle, Kingston, Jamaica; Dr. Juan J. Unoa, San José, Costa Rica; Dr. J. Mills Browne, Surgeon General, United States Navy. Executive President: Dr. Walter Wyman, Surgeon General, United States Marine Hospital Service, Washington. Secretaries; Dr. S. T. Armstrong (English speaking), 166 West Fifty-fourth Street, New York; Dr. G. M. Guitéras (Spanish speaking), United States Marine Hospital Service, Washington. Advisory Council: Dr. H. M. Biggs, New York city; Dr. John C. Boyd, United States Navy; Dr. H. R. Carter, Norfolk, Va.; Dr. W. M. L. Coplin, Philadelphia; Dr. A. G. Clopton, Galveston, Texas; Dr. C. G. Currier, New York; Dr. S. Durgin, Boston; Dr. Seneca Egbert, Philadelphia; Dr. George Homan, St. Louis; Dr. W. T. Jenkins, New York; Dr. J. F. McShane, Baltimore; Dr. G. H. F. Nuttall, Baltimore; Dr. S. R. Olliphant, New Orleans; Dr. Dabney Scales, Mobile; Dr. R. M. Swearingen, Austin, Tex.

The executive president desires to call the attention of all members of the medical profession that are interested in the topics pertaining to this Section to the regulation of the congress, that contributors are required to forward, not later than July 1, to the secretary of the section, abstracts, not to exceed six hundred words each, of the papers they propose to present before the Section.

The topics that will be considered by this section are as follows: 1. The hygiene of vessels, commercial or naval, including the questions of ventilation, heating, sanitary arrangements, the disposal of cargo so as to facilitate disinfection, food supply, etc. 2. The medical officers of passenger vessels; methods for their selection, duties, etc. 3. The vital statistics of seamen and firemen. The question of the medical examination of crews preparatory to shipping. 4. The supervision of vessels by government medical inspectors at ports of arrival and of departure. Code of rules for handling an epidemic disease that breaks out on shipboard. Disinfection of passengers and crew during a voyage. Location and arrangement of ships' hospitals. 5. Epidemic and exotic diseases propagated by shipping. What diseases should be quarantined. Responsibility of nations for epidemics; India for cholera, South America for yellow fever. Can a feasible plan be devised to totally exterminate cholera? International intervention to prevent the propagation of cholera or other epidemic diseases by pilgrimages or immigration. 6. International uniformity in quarantine regulations. Should quarantine officers be notaries public? 7. Arrangement of detail and equipment of quarantine stations: *a*, inspection stations; *b*, local quarantine stations; *c*, refuge stations. Methods for handling infected or suspected vessels. Interstate and inland quarantine; sanitary cordons; camps of refuge; camps of probation. Recent improvements in hospitals for infectious diseases. Railroad inspection and quarantine. Length of time vessels should be held in quarantine. Conditions that should determine proclamation of quarantine against a country. Under what requirements may passenger traffic be carried on between a port infected with yellow fever and a southern port of the United States during the summer with the least obstruction to such traffic? What merchandise should be considered as requiring treatment if shipped from a port or place infected with cholera, yellow fever or small-pox? 8. Methods of disinfection: *a*, persons; *b*, baggage; *c*, cargoes; *d*, vessels. Recent improvements in quarantine appliances; steam chambers; sulphur furnaces. Liquid sulphur dioxide as a disinfectant. Treatment of ballast; water; solid. What time should an infected vessel be detained in quarantine? *a*, for cholera; *b*, for small-pox; *c*, for typhus fever; *d*, for plague; *e*, for yellow fever. Methods of disposal of the bodies of those that die while in quarantine.